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PAFEC75 ON THE A.U.W.E. ICL 1904S\*. A USERS' GUIDE, (U)  
APR 78 W J BUTTERWORTH

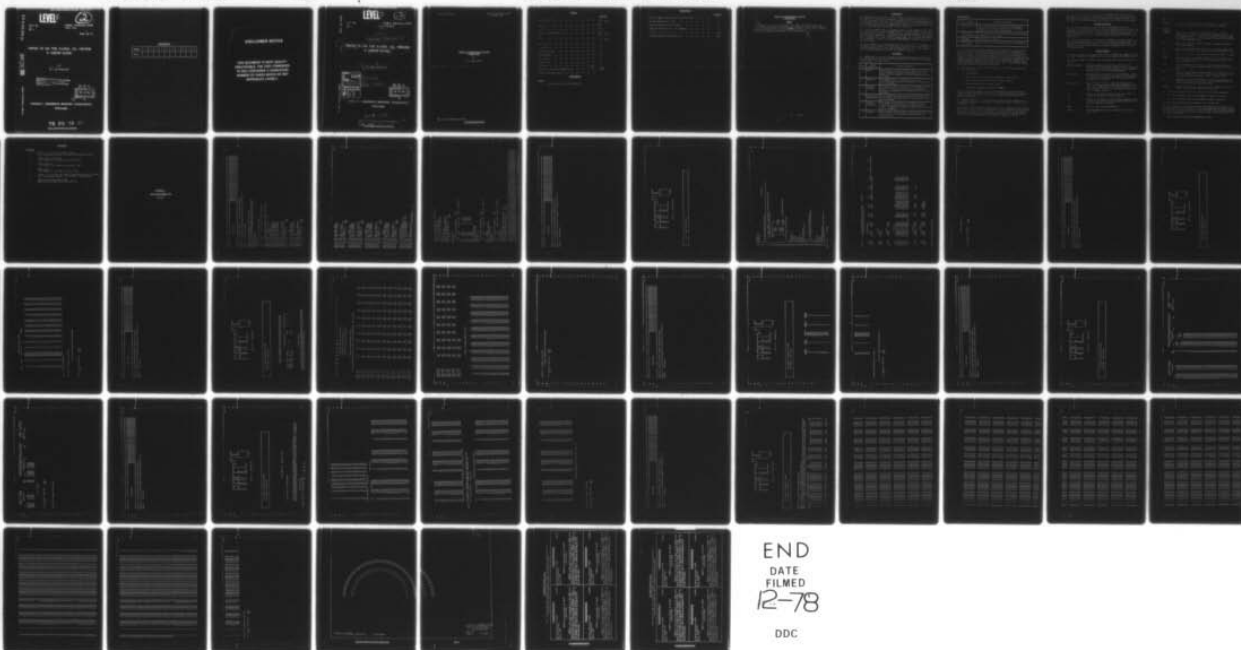
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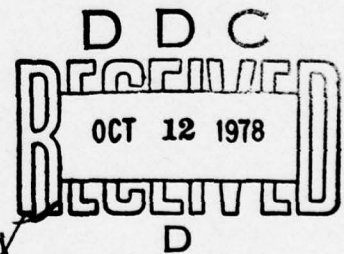
PAFEC 75 ON THE A.U.W.E. ICL 1904S\*  
A USERS' GUIDE

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A USERS' GUIDE,

BY

10 W.J. BUTTERWORTH

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PAFEC75 ON THE A.U.W.E. ICL 1904S\*  
A USERS GUIDE

by

W. J. Butterworth

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CONTENTS

|  | <u>Page No.</u> |
|--|-----------------|
| Duplicate Front Cover ... ..               | (i)             |
|  | (ii) Blank      |
| Title Page ... ..                          | (iii)           |
| Contents ... ..                            | (iv)            |
| Distribution (Detachable) ... ..           | (v)             |
|  | (vi) Blank      |
| Precis ... ..                              | 1               |
|  | 2 Blank         |
| Introduction .. ...                        | 3               |
| The System ... ..                          | 3-5             |
| Preparation of Data ... ..                 | 5               |
| Running PAFEC75 ... ..                     | 5-7             |
| Files Created ... ..                       | 8               |
| Example of Run ... ..                      | 8               |
| References ... ..                          | 9               |
| Appendix A: Output from Example Run .. ... | A1-A43          |
| Abstract Cards (Detachable) ... ..         |                 |

ILLUSTRATIONS

Figure

- 1 Displaced Shape Plot from Example Run

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|  | <u>Copy No.</u> |
|--|-----------------|
| R.N.E.C., Manadon (Attention of Lt. Cdr. P. Luck) ... .. | 1               |
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| PAFEC Ltd. (Attention Dr. R. D. Henshell ..              | 4               |
| D.R.I.C. ... ..  | 5-32            |
| A.U.W.E. Library for distribution ... ..                 | 33-55           |

PAFEC75 ON THE A.U.W.E. ICL 1904S\*  
A USERS GUIDE

PRÉCIS

1. PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.

## INTRODUCTION

2. PAFEC (Program for Automatic Finite Element Calculations) is a suite of programs which is capable of carrying out a large range of engineering calculations on engineering structures. Its development started at Nottingham University in the middle 1960's and it was first issued commercially in 1970 as PAFEC70. In late 1972 this was superseded by PAFEC70\* and extensions were issued, when available. It was implemented at A.U.W.E. in 1976. (Ref. 1).

3. In 1976 the PAFEC group at Nottingham formed a company (PAFEC Ltd) to exploit the system. They then produced PAFEC75 based on a revised layout for input data, designed largely by users in 1974, together with internal changes to the scheme. This version was implemented at A.U.W.E. during 1977 and was finally made available to general users of the 1904S\* in January 1978. It is intended that PAFEC75 will eventually be mounted on a dedicated PAFEC/GRAPHICS computer, hopefully at the end of 1978.

4. Whilst PAFEC75 is well documented (Refs. 2, 3 and 4) it is the variation implemented on the 1904S\* that is described as far as the user is concerned. The method of implementation is described elsewhere (Ref. 5). It is also assumed that the user is already able to use the computer. (Ref. 6).

## THE SYSTEM

5. PAFEC75 uses a series of 10 phases each loading a program. The data is in modular form and if some parts are omitted default values are used. The phases are described in the table below.

| Phase | Short description         | Detailed description   |
|-------|---------------------------|--|
| 1     | Read                      | Data modules are read in, default values are inserted and the modules are placed onto backing store. The NODES module is expanded so that all mid-side nodes are included.     |
| 2     | PAFBLOCKS                 | Any PAFBLOCK data is replaced by the full nodal co-ordinate and topological description of the complete mesh of elements.  |
| 3     | IN.DRAW structure         | The structure itself is drawn. At this stage it is not possible to show any results such as displacements, stresses or temperatures since these have not yet been evaluated.   |
| 4     | Pre-solution housekeeping | In this PHASE the constraints on the problem are considered and a numbering system for the degrees of freedom is derived.  |
| 5     | IN.DRAW constraints       | This PHASE is very similar to the PHASE 3 except of course the constraints which have been applied are shown. Conversely the degrees of freedom can be indicated on a drawing. |
| 6     | Elements                  | The stiffness (or other such as conductivity, mass etc.) matrices of all the elements are found and put onto backing store.  |

Table (Cont'd)

| Phase | Short description      | Detailed description   |
|-------|------------------------|--|
| 7     | Solution               | The system equations are solved for displacements, temperatures or whatever happens to be the primary unknowns in the problem being tackled. |
| 8     | OUT.DRAW displacements | The primary unknowns in the problem (i.e. displacements or temperatures) are drawn.  |
| 9     | STRESS                 | The stresses are found.  |
| 10    | OUT.DRAW stresses      | Stress contour, stress vector plate etc. are produced.   |

6. In the system at A.U.W.E., programs have been compiled in advance and use made of a facility for increasing the core requirement of a program whilst running in order to enlarge an array BASE (which is used by most routines and whose size depends on the problem). Due to the limitation of 150K core size, imposed by the installation manager, the greatest possible size of BASE (at its maximum in phase 7) is 55000. It is hoped that the dedicated computer will have a paged environment thus allowing larger sizes of BASE. This system of pre-compiled programs reduces the time taken for each job. It does however assume that certain element combinations are excluded.

7. The elements are taken from a library (Refs. 3, 4) and are mainly broken up into 5 categories:

- a. Beam elements.
- b. Plane stress, plane strain and axisymmetric elements (2D).
- c. Plate bending and flat faced shell elements (SHELL).
- d. Three dimensional solid elements (3D).
- e. Temperature or Laplacian elements (THERMAL).

The only combination assumed is between beam and shell elements which have a combined program. Any other combination will require a program to be specially written together with a macro to run it. This can be done by JCA1 staff at A.U.W.E. if required.

8. PAFBLOCKS (Phase 2) is a system whereby a mesh of finite elements can be created by specifying the topology of a block and the layout of the mesh in the block (Refs. 3, 4).

9. Using the series of phases enables the job to be stopped at certain stages. These usually coincide with a plotting phase so that the drawing can be inspected for any curious element distortions etc. It is also possible to run phases 6 and 7 on their own as they are those which involve the most computer time and core size in their execution and this enables the longer jobs to run.

10. At the time of writing this guide it is EASIDATA only (Ref. 3) which is implemented. This should be sufficient for most users but it is hoped that the full DATA system (Ref. 4) will be implemented later. Whether this will be on the 1904S\* or the dedicated computer will depend on the time scale and demand.

#### PREPARATION OF DATA

11. The written programs preclude the USE. and READ.FROM. facilities (Refs. 3, 4). The USE. facility would require a specially written program. The READ.FROM. facility is catered for in one of the parameters to the macro to run the system. Also the control of the phasing is done by parameters to the running macro and not by means of PHASE and SAVE commands in the CONTROL module (Refs. 3, 4).

12. Apart from these limitations the data is prepared in the same format as shown in the manuals (Refs. 3, 4). There are two points to make however. It is preferable that the CONTROL module is the first in the data and the FAST. READ facility does not give such a benefit in speed of reading and will not allow continuation lines.

#### RUNNING PAFEC75

13. Three macros are used in the system. These are RUN75 and CLEAR75 which are only used for PAFEC75 and PLOTMAC which is used in common with PAFEC70+ (Ref. 1).

14. RUN75, as might be expected, runs the system and has the following parameters:

|                  |  |
|------------------|--|
| DATA <filename>: | Where <filename> is the data file. Note that the absolute name is required if the file is not in <account> specified by DY below. This parameter is only required for Phase 1 and is ignored in other phases.                                      |
| OUT <ident> :    | Where <ident> is a string of up to 8 characters on which the output file names are to be based. If this parameter is absent the job identifier (or the first 8 characters if more than 8) is used.   |
| DY <account> :   | Where account is that in which the files are to be created. The account must exist and be available to the user. This parameter is not needed when running in the main account. It facilitates the erasure of files later (but see CLEAR75 below). |
| STn :            | Where n is the phase at which the job is to start. If omitted the job tries to start at Phase 1.   |
| PLn :            | Where n is the number of the plot phase required. Such a parameter is required for each plot phase required unless STn above denotes a plot phase.   |
| ENDn :           | Where n is the last phase required.  |
| BLOCK :          | When PAFBLOCKS (Phase 2) are being used. Not needed if ST2 is used.  |

2D     }  
 3D     }  
 BSH    }  
 THERMAL):

One of these is required to indicate which type of element is being used in Phases 6 and 9. If omitted 2D is assumed.

DYNAMIC)  
 STATIC )  
 THERMAL):

One of these is required to indicate the type of solution (Phase 7). Of course for thermal work the parameter is the same as for Phases 6 and 9 so only one is required! If omitted STATIC is assumed. They can all be contracted to the first three characters. (i.e. DYN, STA, THE).

JTn     :     Where n is the total job time required. By default 10 minutes (the system default).

TIn     :     Where n is the program time required for each phase. By default 300 seconds (5 mins). This time is carried into PLOTMAC if used.

BASEn   :     Where n is the size of base required. By default 5000 is assumed.

CLEAR   :     This sets up a call to CLEAR75 (para. 17) which clears out the files created, except for those output for graph plotting. This can be shortened to CL.

SAVE     :     Saves the magnetic tape file(s) carrying information between Phases 6 and 7 which are normally erased. (Para. 24). SV can be used.

LIST     :     Causes the large number of output files to be listed on the line printer. Normally only those for Phases 7 and 9 (results) or the current file at any failure are listed. LI can be used.

NEJ     :     Suppresses the issuing of ENDJOB in a successful background job. Ignored in the event of any error. (It is assumed that the rest of the job depends on a successful run!!).

RETAIN   :     Retains the monitor file in the event of an ENDJOB issued by the macro. (See para. 26). RET or RT can be used.

15. There are only two restrictions in the order of the above parameters:

- a. The DY parameter should precede DYNAMIC (or DYN) (if present).
- b. The ST parameter should precede STATIC (or STA) (if present).

Apart from these restrictions the parameters can be in any order.

16. The formidable list of parameters should not frighten users! They are not all necessary at once. In fact for a static, 2D analysis run in the main account with BASE less than 5000, job time less than ten minutes (and presumably proptime less than five minutes), no plotting, no pafblocks and no retained monitor file the command needs to be:

RJ <ident>, :<account>, RUN75, PARAM(DATA<filename>)

However if more than 5 or 6 parameters are needed it is preferable, when adding a job to the operators' background queue, to set up the call in a small file i.e.

IN FILENAME

RUN75 DATA PAFDAT,OUT PAFANS,BLOCK,PL3,END3,BASE 10000,RT,JT 900,DY< account>

\*\*\*\*

Then

RJ <ident>, <account>, FILENAME (where <account> here is the main account)

This facilitates the task of the operators when issuing jobs from their background queue.

17. CLEAR75 is responsible for dealing with the debris left by RUN75. It is able to cope with the remains of more than one job and requires the following parameters:

/<ident> : The identifier used in creating the files.

DY<account>: Causes the erasure to take place in the appropriate pseudo account.

PLOT : Causes the erasure of associated redundant plot files. These are not usually erased, in case of plotter/computer failure.

18. The first two parameters can be repeated as necessary. If all the files are in one pseudo account only one DY is needed. Otherwise one is needed paired with each /parameter. For example.

CLEAR75 /UBFSBO1,DY:XYZA,DY:XYZB,/UBFSBO2  
would clear all files based on UBFSBO1 in :XYZA  
and UBFSBO2 in :XYZB

CLEAR75 /UBFSBO1,DY:XYZA,DY:XYZB,/UBFSBO2,/UBFSBO3  
would clear all files based on UBFSBO1 in :XYZA  
UBFSBO2 in :XYZB  
and UBFSBO3 in :XYZB

19. PLOTMAC is called from inside RUN75 but can also be called by the user. Its use is described elsewhere (Ref. 1). There is one modification that has now been made, no real mag tapes are used and a series of pseudo mag tape files is set up. This has no direct effect on the user but makes the life of the computer staff a lot easier!!

20. One modification made at A.U.W.E. is to check on the maximum size of BASE used (as opposed to that asked for!). This is noted at the end of the output for each phase and listed to the monitor file (see para. 29 and Appendix A pp1 and 9) and also affords a check on the size of BASE obtained (which is not always the same as that asked for due to limitations on core size).

21. In the event of any program failure the macro RUN75 is ended (a background job is terminated even if NEJ is present) and the current output file (if one exists) is listed on the line printer.

## FILES CREATED

22. TR<ident> is the line printer output file. It has a generation number corresponding to the phase and a language code ANSA. If the first file for any phase becomes full (either due to the limit of 8192 transfers or physical size) a second file is assigned with code ANSB - and so on up to ANSZ.

23. B<ident>S is the disc file containing backing store information (referred to as BS in literature). It is 240 kwords long. After each phase is run B<ident>S is copied into H<ident>S. In the event of a successful run H<ident>S is erased but in the event of failure (usually due to BASE being too small or the time being insufficient) it is left in the filestore to be copied back by the macro before the phase is rerun. This has been found to be necessary as a restart may find B<ident>S changed!!

24. M<ident>T is a pseudo mag tape file to carry information between phases 6 and 7. If this file is nearly filled, a second is assigned from inside the program and so on. The language code of the first file is FIRS, subsequent codes are AAMT-AZMT-BAMT-BZMT-CAMT and so on to ZZMT thus catering for 677 files. Usually erased after Phase 7 is run but see SAVE parameter for RUN75 (para. 14).

25. Z<ident>Qn is the card image file output by each plot phase to be presented to PLOTMAC where n denotes the phase i.e. Z<ident>Q3 for Phase 3. It is the file from Phase 10 which sets the limit of 8 characters on <ident> (from the limit of 12 characters for a filename). These files can have more than one generation number due to the card image file being filled.

26. M<ident>N is the retained monitor file name.

27. It should be remembered that <ident> is normally the job identifier unless OUT is being used and the files are all created in the pseudo account (if any) in which the job is run.

## EXAMPLE OF RUN

28. The monitor file of the run and the listings of the output from the phases are to be found in Appendix A. The monitor file (pp A1-A3) shows the contents of :AAHC before the run (p A1), the effect of NEJ, the contents of :AAHC after the run (p A3) noting that the job is now in :AAHC. Then the effect of CLEAR75 can be seen when the LD command shows that the only files left are the data file and plotter output file. A further use of CLEAR75 with the PLOT parameter clears the plot file as well. RUN75 without any ST and DATA parameters gives rise to the DISPLAY and the job is terminated. Another RUN75 with DATAORB was included in the macro which would have given rise to the DISPLAY DATA FILE DOES NOT EXIST.

29. It can also be seen from the monitor file that the maximum size of BASE used was 2990 in Phase 9 (p A3) followed by 2022 in Phase 8 (p A2), 1851 in Phase 6 (p A2) and 1759 in Phase 7 (p A2). From page A1 it can be seen that the size required in Phase 1 is only 131.

30. The plot of the displaced shape from Phase 8 can be seen in Fig. 1. From the output from Phase 8 (p A31) the SCALE OF DISPLACEMENTS should be 0.994E-5 per cm. There is also some sorting of the layout of the labelling in the bottom right hand corner which will have to be done.

31. It should be noted that without the LI parameter the only listings (apart from the monitor file) would be from Phase 7 (pp A22-A27) and Phase 9 (pp A33 - A43) a total of 17 pages instead of 40.

REFERENCESReference

- 1 PAFEC on the A.U.W.E. ICL 1904S\* Computer.  
W. J. Butterworth, A.U.W.E. Publication 43584, May 1977 (U/U).
- 2 PAFEC75 Theory and Results.  
R. D. Henshell (ed.), PAFEC Ltd., December 1975.
- 3 PAFEC75 EASIDATA.  
R. D. Henshell (ed.), PAFEC Ltd., September 1976.
- 4 PAFEC75 DATA.  
R. D. Henshell (ed.), PAFEC Ltd., April 1976.
- 5 PAFEC75 on the A.U.W.E. ICL 1904S\* - Implementation and its problems.  
W. J. Butterworth, A.U.W.E. To be issued. 1978 (C-in-C).
- 6 AUWE Computer Service User Guide.  
AUWE Publication 31904 3rd ed June 1976 (U).

APPENDIX A

OUTPUT FROM EXAMPLE RUN

(A1-A43)

[illegible]

#LISTING OF :AAM,UJCWB/0(1/8100) PRODUCED ON 21MAR/8 AT 08.47.24  
#OUTPUT BY LISTFILE IN :AAM,UJCWB/0\* ON 21MAR/8 AT 08.47.25 USING U14

DOCUMENT : AAM-UJCSWB/OC/B1B0)

STARTED :AAM,UUCWB/O,21MAR/8 U8.26.4/ TYPE:BAK

OR. 26.474 NJ NJCWB/O, LESTPAE  
16/3/78 DUE TO CORRUPTION A GENERAL RESTORE HAS BEEN DONE FROM  
DUMP TAKEN AT 16.20 ON 15/3/78. ALL WORK AFTER THIS TIME LOST.

08.26.47+ TESTRAF  
08.26.47+ LD :AAMC  
08.26.47+ LF !

## LISTING OF DIRECTORY : AAHC

[illegible]

```
FILE SPHERE 1
08:24.4* RUN/5 DY:AARC,DATASPHERE,OUT08,LT,NEJ,BLOCK,PL0
08:24.4* 1A AB,CN,CT
TEST:LAY. *** DATA FILE SPHERE ***
```

DISPLAY: \*\*\* PHASE 1

08.24.52 U.01 USED URGENCY M

08.25.45 0.04 CORE GIVEN 47080

08.27.45 FREE • DAZ • 3/1 TRANSFERS

08.27.45 FREE - CRU .55 TRANSFERS

08.27.45 FREE \*CBI, J. RAYNES

98-27-65 FREE PAY 1,21 TRANSFERS

08-27-40 FREE - (20) 12MS/ERS

100

08.27.40 FREE - DAY, 125 TRANSFERS

08-27-66 0.14 DELETED, CLOKED 0.0

DISPLAY: END OF PHASE 1

```

*** MAX SIZE OF BASE USED      131
                                5000

```

DISPLAY: \*\*\*

08-28-46 0.1/ CORE GIVEN 51936

08.24.22 FREE • DAZ , 29 TRANSFERS

08.29.27 FREE • LPU • 18% TRANSFERS

DISPLA: 11

0.23 : 0.76 TRANSFERS

08-29-28 0-25 DELETED, CLOKED 0-05

DISPLAY: END OF PHASE 2

```

*** MAX SIZE OF BASE USED
1052
5000

```

**Figure 1**

A2 ○

```

08.30.58 0.27 CORE GIVEN 32192
08.30.57 FREE *0A2 .31 TRANSFERS
08.30.57 FREE *LPU .198 TRANSFERS
DISPLAY : 11
0.52 : DELETED : 00
08.30.57 FREE *0A0 .0 TRANSFERS
08.30.57 0.52 DELETED,CLOCKED 0.04
DISPLAY: END OF PHASE 4
*** MAX SIZE OF BASE USED 1666
SET TO 5000

```

```

DISPLAY: ***      PHASE 0
08.51.46 0.56 CORE GIVEN 50532
08.55.44 FREE INTO 157 TRANSFERS
08.55.44 FREE *042 15 TRANSFERS
08.55.44 FREE *100 89 TRANSFERS
DISPLAY: 11
1.40: DELETED : 00
08.55.44 FREE *040 1220 TRANSFERS
08.55.44 1.40 DELETED, CLUCKED 1.01
DISPLAY: END OF PHASE 0
**** MAX SIZE OF BASE USED 1851
          SET TO 5000

```

```

DISPLAY: *** PHASE 7
08.36.40 1.44 LURE GIVEN 3/504
08.36.14 FREE *DTU *154 TRANSFERS
08.36.15 FREE *DX1 *51 TRANSFERS
08.36.15 FREE *DA2 *13 TRANSFERS
08.36.16 FREE *LPU *253 TRANSFERS
DISPLAY: 11
2.17 :DELETED : 00
08.36.16 FREE *DAU *44 TRANSFERS
08.36.16 2.17 DELETED,CLOCKED 0.52
DISPLAY: END OF PHASE 7
**** MAX SIZE OF BASE USED 1/50
SET TO 5000

```

```

DISPLAY: ***          PHASE 8
08-59.13 2.22 CORE GIVEN 41408
08-50.09 FREE *CP5 2135 TRANSFERS
08-50.10 FREE *QAZ 15 TRANSFERS
08-50.10 FREE *LPJ 424 TRANSFERS
      DISPLAY : 11
2.55 DELETED : 00
08-50.11 FREE *QAU 0 TRANSFERS
08-50.11 2.52 DELETED,CLOCKED 0.11
      DISPLAY: END OF PHASE 8
      *** MAX SIZE OF BASE USED
              SMT TO
              5000

```

08.40.21 2.37 USED URGENCY G  
08.40.25 2.37 CORE GIVEN 7040  
DISPLAY : OFFLINE PLOT FILE OPENED 08.40  
08.42.40 FREE \*MT2 ,721 TRANSFERS  
2.55 :MATED : END OF OFFLINING TAPE CLOSED  
08.42.42 FREE \*CR0 ,2134 TRANSFERS  
DISPLAY : 11

08.42.45 2.55 DELETED,CLOCKED U.16  
DISPLAY; ISSUING BACKGROUND PLUT JOB





LEVEL 1.3 - OCTOBER 1977

PHASE NUMBER 1 STAKIS HERE

## TEST JOB 24

```

1 CONTROL
2 AXISYMMETRIC
3 CONTROL.END
4 C
5 C
6 C
7 TITLE CHECK ON PARLOCKS FOR SPHERE
-----
8 C
9 C 20 = 36210 ELEMENTS IN AXISYMMETRIC REPRESENTATION OF SPHERE
10 C PRESSURE APPLIED TO OUTER SURFACE
11 C
12 C
13 C DISPLACEMENTS ARE :
14 C NODE UX UY
15 C 1 1.9828 *
16 C 2 1.8932 *
17 C 3 *
18 C 4 -1.9801
19 C 5 -1.9828 *
20 C 6 -1.8932 *
21 C 7 1.8917 -0.0984 )SYMMETRICAL ABOUT X=0
22 C 64 -1.8917 -0.0984 )
23 C DIVISION FACTOR FOR ABOVE 0.1E6
24 C
25 C
26 C
27 C
28 C
29 C
30 C
31 C
32 C
33 C
34 C
35 C
36 C
37 C
38 C
39 C
40 C
41 C THE FOLLOWING CAN BE CHANGED TO SET
42 C IF NODE ELEMENTS ROUND THE CIRCUMFERENCE
43 C
44 C
45 C
46 C
47 C
48 C
49 C
50 C
51 C
52 C
53 C
54 C
55 C
56 C
57 C
58 C
59 C
60 C
61 C
62 C
63 C
64 C
65 C
66 C
67 C
68 C
69 C
70 C
71 C
72 C
73 C
74 C
75 C
76 C
77 C
78 C
79 C
80 C
81 C
82 C
83 C
84 C
85 C
86 C
87 C
88 C
89 C
90 C
91 C
92 C
93 C
94 C
95 C
96 C
97 C
98 C
99 C
100 C

```

END OF DATA 0 ERRORS

A7

\*\*\*\*\*  
ALL INPUT DATA MODULES FOLLOW AS STORED  
ON BACKING STORE AT THE END OF PHASE 1.  
\*\*\*\*\*

BLUC TYPE PAFRLUCKS GMMU ELEM PHUP N1 N2 N3 N4 N5  
1.0000 1.0000 1.0000 36210. 4.0000 1.0000 0.00000E 00 0.00000E 00 0.00000E 00  
2.0000 0.0000 1.0000 5.0000 4.0000 0.00000E 00 0.00000E 00 3.0000

MESH  
REFE SPAC  
1.0000  
2.0000 50.000

PLAT MATE THIC  
4.0000 4.0000 1.0000

MATERIAL E NU RU ALPH MU K SH  
1.0000 0.2000E 12 0.30000 7800.0 0.11000E-04 0.50000E-02 48.000 452.00  
2.0000 0.19500E 12 0.30000 7700.0 0.12000E-04 0.50000E-02 24.500 440.00  
3.0000 0.12500E 12 0.25000 7100.0 0.12000E-04 0.50000E-02 54.000 586.00  
4.0000 0.68500E 11 0.35000 2695.0 0.24500E-04 0.10000E-01 238.00 900.00  
5.0000 0.70000E 11 0.35000 2800.0 0.22000E-04 0.10000E-01 190.00 879.00  
6.0000 0.75000E 11 0.35000 3000.0 0.20000E-04 0.10000E-01 180.00 856.00  
7.0000 0.11000E 12 0.30000 4555.0 0.85000E-05 0.50000E-02 168.60 582.00  
8.0000 0.61000E 11 0.25000 2224.0 0.72000E-05 0.20000E-01 8.4000 795.00  
9.0000 0.34500E 10 0.45000 1250.0 0.60000E-04 0.50000E-01 0.20000 800.00  
10.000 0.30000E 11 0.00000E 00 2400.0 0.10000E-04 0.50000E-01 1.5000 653.00

LOAD PRES PRESSURE STAP FINI STEP LIST  
1.0000 0.20205E 06 6.0000 6.0000 1.0000 2.0000 4.0000

RESTRAINTS  
NODE PLAN AXIS DIME VALU  
1.0000 2.0000 1.0000 2.0000 0.00000E 00  
4.0000 1.0000 1.0000 1.0000 0.00000E 00

NO ERRORS OR WARNINGS IN THIS PHASE

A8

\*\* END OF PHASE 1 \*\*

\*\*\*\* MAX SIZE OF BASE USED 131  
SET TO 5000

:AAH.UJCSWB70

\*LISTING OF :AACH.IRORB(2/ANSA) PRODUCED ON 21MAR78 AT 08.29.27  
 \*OUTPUT BY LISTFILE IN :AACH.JVCWB/01 ON 21MAR78 AT 08.29.32 USING U14  
 DOCUMENT IRORB(2/ANSA)

A10

```
PPPPPP AAAAAA FFFFFF EEEEE CCCCC
P A A FF E C CC
P A A FF E C CC
P A A FF E C CC
PPPPPP AAAAAA FFFFFF EEEEE CCCCC
PP AA A F EE C C
PP AA A F EE C C
PP AA A F EE C C
PP AA A F EE C C
PP AA A F EE C C
PP AA A F EEEEE CCCCC
/ 5 55555
```

LEVEL 1.3 - OCTOBER 1977

.....

TITLE CHECK UN PAFBLOCKS FOR SPHERE

.....

PHASE NUMBER 2 STAKIS HERE

.....

## MODULE 1 GLOBAL COORDINATES

| NODE | X       | Y      | Z      | NODE | X       | Y       | Z      |
|------|---------|--------|--------|------|---------|---------|--------|
| 1    | -0.9500 | 0.0000 | 0.0000 | 51   | 0.7432  | 0.6691  | 0.0000 |
| 2    | -1.0000 | 0.0000 | 0.0000 | 52   | 0.7772  | 0.6293  | 0.0000 |
| 3    | 0.0000  | 0.9500 | 0.0000 | 53   | 0.8091  | 0.5878  | 0.0000 |
| 4    | 0.0000  | 1.0000 | 0.0000 | 54   | 0.8387  | 0.5446  | 0.0000 |
| 5    | 0.9500  | 0.0000 | 0.0000 | 55   | 0.8660  | 0.5000  | 0.0000 |
| 6    | 1.0000  | 0.0000 | 0.0000 | 56   | 0.8910  | 0.4540  | 0.0000 |
| 7    | -0.9985 | 0.0524 | 0.0000 | 57   | 0.9135  | 0.4067  | 0.0000 |
| 8    | -0.9944 | 0.1046 | 0.0000 | 58   | 0.9335  | 0.3584  | 0.0000 |
| 9    | -0.9875 | 0.1565 | 0.0000 | 59   | 0.9509  | 0.3090  | 0.0000 |
| 10   | -0.9780 | 0.2079 | 0.0000 | 60   | 0.9658  | 0.2588  | 0.0000 |
| 11   | -0.9628 | 0.2568 | 0.0000 | 61   | 0.9780  | 0.2079  | 0.0000 |
| 12   | -0.9509 | 0.3090 | 0.0000 | 62   | 0.9875  | 0.1565  | 0.0000 |
| 13   | -0.9335 | 0.3584 | 0.0000 | 63   | 0.9944  | 0.1046  | 0.0000 |
| 14   | -0.9135 | 0.4067 | 0.0000 | 64   | 0.9985  | 0.0524  | 0.0000 |
| 15   | -0.8910 | 0.4540 | 0.0000 | 65   | -0.9750 | -0.0000 | 0.0000 |
| 16   | -0.8660 | 0.5000 | 0.0000 | 66   | -0.9695 | 0.1019  | 0.0000 |
| 17   | -0.8387 | 0.5446 | 0.0000 | 67   | -0.9535 | 0.2027  | 0.0000 |
| 18   | -0.8091 | 0.5878 | 0.0000 | 68   | -0.9272 | 0.3015  | 0.0000 |
| 19   | -0.7772 | 0.6293 | 0.0000 | 69   | -0.8906 | 0.3966  | 0.0000 |
| 20   | -0.7432 | 0.6691 | 0.0000 | 70   | -0.8444 | 0.4875  | 0.0000 |
| 21   | -0.7071 | 0.7071 | 0.0000 | 71   | -0.7888 | 0.5731  | 0.0000 |
| 22   | -0.6692 | 0.7431 | 0.0000 | 72   | -0.7246 | 0.6524  | 0.0000 |
| 23   | -0.6294 | 0.7771 | 0.0000 | 73   | -0.6524 | 0.7246  | 0.0000 |
| 24   | -0.5878 | 0.8090 | 0.0000 | 74   | -0.5731 | 0.7888  | 0.0000 |
| 25   | -0.5446 | 0.8387 | 0.0000 | 75   | -0.4875 | 0.8444  | 0.0000 |
| 26   | -0.5000 | 0.8660 | 0.0000 | 76   | -0.3966 | 0.8906  | 0.0000 |
| 27   | -0.4540 | 0.8910 | 0.0000 | 77   | -0.3015 | 0.9272  | 0.0000 |
| 28   | -0.4067 | 0.9135 | 0.0000 | 78   | -0.2027 | 0.9535  | 0.0000 |
| 29   | -0.3585 | 0.9335 | 0.0000 | 79   | -0.1019 | 0.9697  | 0.0000 |
| 30   | -0.3090 | 0.9509 | 0.0000 | 80   | 0.0000  | 0.9750  | 0.0000 |
| 31   | -0.2588 | 0.9658 | 0.0000 | 81   | 0.1019  | 0.9697  | 0.0000 |
| 32   | -0.2079 | 0.9780 | 0.0000 | 82   | 0.2027  | 0.9535  | 0.0000 |
| 33   | -0.1564 | 0.9875 | 0.0000 | 83   | 0.3015  | 0.9272  | 0.0000 |
| 34   | -0.1045 | 0.9945 | 0.0000 | 84   | 0.3966  | 0.8906  | 0.0000 |
| 35   | -0.0523 | 0.9986 | 0.0000 | 85   | 0.4875  | 0.8444  | 0.0000 |
| 36   | 0.0023  | 0.9986 | 0.0000 | 86   | 0.5731  | 0.7888  | 0.0000 |
| 37   | 0.1045  | 0.9945 | 0.0000 | 87   | 0.6524  | 0.7246  | 0.0000 |
| 38   | 0.1564  | 0.9875 | 0.0000 | 88   | 0.7246  | 0.6524  | 0.0000 |
| 39   | 0.2079  | 0.9780 | 0.0000 | 89   | 0.7888  | 0.5731  | 0.0000 |
| 40   | 0.2588  | 0.9658 | 0.0000 | 90   | 0.8444  | 0.4875  | 0.0000 |
| 41   | 0.3090  | 0.9509 | 0.0000 | 91   | 0.8906  | 0.3966  | 0.0000 |
| 42   | 0.3585  | 0.9335 | 0.0000 | 92   | 0.9272  | 0.3015  | 0.0000 |
| 43   | 0.4067  | 0.9135 | 0.0000 | 93   | 0.9535  | 0.2027  | 0.0000 |
| 44   | 0.4540  | 0.8910 | 0.0000 | 94   | 0.9697  | 0.1019  | 0.0000 |
| 45   | 0.5000  | 0.8660 | 0.0000 | 95   | -0.9750 | -0.0000 | 0.0000 |
| 46   | 0.5446  | 0.8387 | 0.0000 | 96   | -0.9695 | 0.1019  | 0.0000 |
| 47   | 0.5878  | 0.8090 | 0.0000 | 97   | -0.9535 | 0.2027  | 0.0000 |
| 48   | 0.6294  | 0.7771 | 0.0000 | 98   | -0.9272 | 0.3015  | 0.0000 |
| 49   | 0.6692  | 0.7431 | 0.0000 | 99   | -0.8906 | 0.3966  | 0.0000 |
| 50   | 0.7071  | 0.7071 | 0.0000 | 100  | -0.7432 | 0.6691  | 0.0000 |

A 12

| NODE | X       | Y      | Z      | NUDE | X      | Y      | Z      |
|------|---------|--------|--------|------|--------|--------|--------|
| 101  | -0.9034 | 0.2936 | 0.0000 | 128  | 0.1975 | 0.9292 | 0.0000 |
| 102  | -0.8008 | 0.3405 | 0.0000 | 129  | 0.2459 | 0.9176 | 0.0000 |
| 103  | -0.6076 | 0.3664 | 0.0000 | 130  | 0.2935 | 0.9055 | 0.0000 |
| 104  | -0.8464 | 0.4313 | 0.0000 | 131  | 0.3404 | 0.8869 | 0.0000 |
| 105  | -0.8227 | 0.4750 | 0.0000 | 132  | 0.3864 | 0.8679 | 0.0000 |
| 106  | -0.7968 | 0.5174 | 0.0000 | 133  | 0.4313 | 0.8465 | 0.0000 |
| 107  | -0.7666 | 0.5584 | 0.0000 | 134  | 0.4750 | 0.8227 | 0.0000 |
| 108  | -0.7363 | 0.5978 | 0.0000 | 135  | 0.5174 | 0.7967 | 0.0000 |
| 109  | -0.7060 | 0.6357 | 0.0000 | 136  | 0.5584 | 0.7666 | 0.0000 |
| 110  | -0.6718 | 0.6717 | 0.0000 | 137  | 0.5979 | 0.7363 | 0.0000 |
| 111  | -0.6357 | 0.7060 | 0.0000 | 138  | 0.6357 | 0.7060 | 0.0000 |
| 112  | -0.5979 | 0.7363 | 0.0000 | 139  | 0.6717 | 0.6717 | 0.0000 |
| 113  | -0.5584 | 0.7666 | 0.0000 | 140  | 0.7060 | 0.6357 | 0.0000 |
| 114  | -0.5174 | 0.7967 | 0.0000 | 141  | 0.7363 | 0.5978 | 0.0000 |
| 115  | -0.4750 | 0.8227 | 0.0000 | 142  | 0.7666 | 0.5584 | 0.0000 |
| 116  | -0.4313 | 0.8465 | 0.0000 | 143  | 0.7968 | 0.5174 | 0.0000 |
| 117  | -0.3864 | 0.8679 | 0.0000 | 144  | 0.8227 | 0.4750 | 0.0000 |
| 118  | -0.3404 | 0.8869 | 0.0000 | 145  | 0.8464 | 0.4313 | 0.0000 |
| 119  | -0.2935 | 0.9055 | 0.0000 | 146  | 0.8678 | 0.3864 | 0.0000 |
| 120  | -0.2459 | 0.9176 | 0.0000 | 147  | 0.8868 | 0.3405 | 0.0000 |
| 121  | -0.1975 | 0.9292 | 0.0000 | 148  | 0.9034 | 0.2936 | 0.0000 |
| 122  | -0.1466 | 0.9383 | 0.0000 | 149  | 0.9175 | 0.2459 | 0.0000 |
| 123  | -0.0993 | 0.9448 | 0.0000 | 150  | 0.9291 | 0.1975 | 0.0000 |
| 124  | -0.0497 | 0.9487 | 0.0000 | 151  | 0.9381 | 0.1466 | 0.0000 |
| 125  | 0.0000  | 0.9487 | 0.0000 | 152  | 0.9446 | 0.0993 | 0.0000 |
| 126  | 0.0993  | 0.9448 | 0.0000 | 153  | 0.9486 | 0.0497 | 0.0000 |
| 127  | 0.1466  | 0.9383 | 0.0000 |      |        |        |        |

|     |        |    |     |      |     |     |      |
|-----|--------|----|-----|------|-----|-----|------|
| 1.  | 36210. | 4. | 8.  | 1.   | 97. | 65. | 96.  |
| 2.  | 36210. | 4. | 8.  | 97.  | 9.  | 66. | 96.  |
| 3.  | 36210. | 4. | 10. | 99.  | 11. | 67. | 100. |
| 4.  | 36210. | 4. | 12. | 101. | 13. | 68. | 102. |
| 5.  | 36210. | 4. | 14. | 103. | 15. | 69. | 104. |
| 6.  | 36210. | 4. | 16. | 105. | 17. | 70. | 106. |
| 7.  | 36210. | 4. | 18. | 107. | 19. | 71. | 108. |
| 8.  | 36210. | 4. | 20. | 109. | 21. | 72. | 110. |
| 9.  | 36210. | 4. | 22. | 111. | 23. | 73. | 112. |
| 10. | 36210. | 4. | 24. | 113. | 25. | 74. | 114. |
| 11. | 36210. | 4. | 26. | 115. | 27. | 75. | 116. |
| 12. | 36210. | 4. | 28. | 117. | 29. | 76. | 118. |
| 13. | 36210. | 4. | 30. | 119. | 31. | 77. | 120. |
| 14. | 36210. | 4. | 32. | 121. | 33. | 78. | 122. |
| 15. | 36210. | 4. | 34. | 123. | 35. | 79. | 124. |
| 16. | 36210. | 4. | 36. | 125. | 37. | 80. | 125. |
| 17. | 36210. | 4. | 37. | 126. | 38. | 81. | 125. |
| 18. | 36210. | 4. | 39. | 128. | 40. | 82. | 129. |
| 19. | 36210. | 4. | 41. | 130. | 42. | 83. | 131. |
| 20. | 36210. | 4. | 43. | 132. | 44. | 84. | 133. |
| 21. | 36210. | 4. | 45. | 134. | 46. | 85. | 135. |
| 22. | 36210. | 4. | 47. | 136. | 48. | 86. | 137. |
| 23. | 36210. | 4. | 49. | 138. | 50. | 87. | 139. |
| 24. | 36210. | 4. | 51. | 140. | 52. | 88. | 141. |
| 25. | 36210. | 4. | 53. | 142. | 54. | 89. | 143. |
| 26. | 36210. | 4. | 55. | 144. | 56. | 90. | 145. |
| 27. | 36210. | 4. | 57. | 146. | 58. | 91. | 147. |
| 28. | 36210. | 4. | 59. | 148. | 60. | 92. | 149. |
| 29. | 36210. | 4. | 61. | 150. | 62. | 93. | 151. |
| 30. | 36210. | 4. | 63. | 152. | 64. | 94. | 153. |
| 31. | 36210. | 4. | 65. | 154. | 65. | 95. | 153. |

NO ERRORS OR WARNINGS IN THIS PHASE

END OF PHASE 2 (PAFBLKS DATA GENERATION)

|     |                       |      |
|-----|-----------------------|------|
| *** | MAX SIZE OF BASE USED | 1532 |
|     | SET TO                | 5000 |



LEVEL 1.3 - OCTOBER 1977

PHASE NUMBER 4 STAKIS HERE

# PROGRAM TO GENERATE EXTRA DATA FOR GAUSSIAN REDUCTION SOLUTION

| ***RESTRAINTS*** |              |           | NODE PLAN AXIS DIRE |     |   |
|------------------|--------------|-----------|---------------------|-----|---|
| 6                | POINTS FOUND | ON PLANE. |                     |     |   |
|                  | NUDES        | 1. 2. 3.  | CASE                | 1   | 2 |
|                  | NUDES        | 45.       | 6.                  | 65. |   |
| 3                | POINTS FOUND | ON PLANE. |                     |     |   |
|                  | NUDES        | 3. 4. 60. | CASE                | 4   | 1 |

\*\*\*FRONT SIZE\*\*\*

THE FOLLOWING LIST ROW BY ROW GIVES THE INSTANTANEOUS FRONT SIZE AS EACH ELEMENT IS MERGED. THE DIMENSION OF THE STIFFNESS MATRIX IS THE MAXIMUM VALUE (PLUS THE NUMBER OF AUTOMATIC MASTERS IN A DYNAMIC ANALYSIS)



| MODE NUMBER | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9  | 10  |
|-------------|---|---|---|---|---|---|---|---|--|---|
| D.U.F. NO.  | 4.001                                       | 1.001                                       | 3.002                                       | 2.002                                       | 4.001                                       | 1.001                                       | 7.001                                       | 8.001                                       | 2.002                                      | 3.002                                       |
| D.U.F. NO.  | 9.001                                       | 12.001                                      | 1.002                                       | 4.002                                       | 9.001                                       | 10.001                                      | 2.002                                       | 3.002                                       | 9.001                                      | 10.001                                      |
| D.U.F. NO.  | 11  | 21  | 31  | 41  | 51  | 61  | 71  | 81  | 91   | 101   |
| D.U.F. NO.  | 111   | 211   | 311   | 411   | 511   | 611   | 711   | 811   | 911  | 1011  |
| D.U.F. NO.  | 1111  | 2111  | 3111  | 4111  | 5111  | 6111  | 7111  | 8111  | 9111                                       | 10111                                       |
| D.U.F. NO.  | 11111                                       | 21111                                       | 31111                                       | 41111                                       | 51111                                       | 61111                                       | 71111                                       | 81111                                       | 91111                                      | 101111                                      |
| D.U.F. NO.  | 111111                                      | 211111                                      | 311111                                      | 411111                                      | 511111                                      | 611111                                      | 711111                                      | 811111                                      | 911111                                     | 1011111                                     |
| D.U.F. NO.  | 1111111                                     | 2111111                                     | 3111111                                     | 4111111                                     | 5111111                                     | 6111111                                     | 7111111                                     | 8111111                                     | 9111111                                    | 10111111                                    |
| D.U.F. NO.  | 11111111                                    | 21111111                                    | 31111111                                    | 41111111                                    | 51111111                                    | 61111111                                    | 71111111                                    | 81111111                                    | 91111111                                   | 101111111                                   |
| D.U.F. NO.  | 111111111                                   | 211111111                                   | 311111111                                   | 411111111                                   | 511111111                                   | 611111111                                   | 711111111                                   | 811111111                                   | 911111111                                  | 1011111111                                  |
| D.U.F. NO.  | 1111111111                                  | 2111111111                                  | 3111111111                                  | 4111111111                                  | 5111111111                                  | 6111111111                                  | 7111111111                                  | 8111111111                                  | 9111111111                                 | 10111111111                                 |
| D.U.F. NO.  | 11111111111                                 | 21111111111                                 | 31111111111                                 | 41111111111                                 | 51111111111                                 | 61111111111                                 | 71111111111                                 | 81111111111                                 | 91111111111                                | 101111111111                                |
| D.U.F. NO.  | 111111111111                                | 211111111111                                | 311111111111                                | 411111111111                                | 511111111111                                | 611111111111                                | 711111111111                                | 811111111111                                | 911111111111                               | 1011111111111                               |
| D.U.F. NO.  | 1111111111111                               | 2111111111111                               | 3111111111111                               | 4111111111111                               | 5111111111111                               | 6111111111111                               | 7111111111111                               | 8111111111111                               | 9111111111111                              | 10111111111111                              |
| D.U.F. NO.  | 11111111111111                              | 21111111111111                              | 31111111111111                              | 41111111111111                              | 51111111111111                              | 61111111111111                              | 71111111111111                              | 81111111111111                              | 91111111111111                             | 101111111111111                             |
| D.U.F. NO.  | 111111111111111                             | 211111111111111                             | 311111111111111                             | 411111111111111                             | 511111111111111                             | 611111111111111                             | 711111111111111                             | 811111111111111                             | 911111111111111                            | 1011111111111111                            |
| D.U.F. NO.  | 1111111111111111                            | 2111111111111111                            | 3111111111111111                            | 4111111111111111                            | 5111111111111111                            | 6111111111111111                            | 7111111111111111                            | 8111111111111111                            | 9111111111111111                           | 10111111111111111                           |
| D.U.F. NO.  | 11111111111111111                           | 21111111111111111                           | 31111111111111111                           | 41111111111111111                           | 51111111111111111                           | 61111111111111111                           | 71111111111111111                           | 81111111111111111                           | 91111111111111111                          | 101111111111111111                          |
| D.U.F. NO.  | 111111111111111111                          | 211111111111111111                          | 311111111111111111                          | 411111111111111111                          | 511111111111111111                          | 611111111111111111                          | 711111111111111111                          | 811111111111111111                          | 911111111111111111                         | 1011111111111111111                         |
| D.U.F. NO.  | 1111111111111111111                         | 2111111111111111111                         | 3111111111111111111                         | 4111111111111111111                         | 5111111111111111111                         | 6111111111111111111                         | 7111111111111111111                         | 8111111111111111111                         | 9111111111111111111                        | 10111111111111111111                        |
| D.U.F. NO.  | 11111111111111111111                        | 21111111111111111111                        | 31111111111111111111                        | 41111111111111111111                        | 51111111111111111111                        | 61111111111111111111                        | 71111111111111111111                        | 81111111111111111111                        | 91111111111111111111                       | 101111111111111111111                       |
| D.U.F. NO.  | 111111111111111111111                       | 211111111111111111111                       | 311111111111111111111                       | 411111111111111111111                       | 511111111111111111111                       | 611111111111111111111                       | 711111111111111111111                       | 811111111111111111111                       | 911111111111111111111                      | 1011111111111111111111                      |
| D.U.F. NO.  | 1111111111111111111111                      | 2111111111111111111111                      | 3111111111111111111111                      | 4111111111111111111111                      | 5111111111111111111111                      | 6111111111111111111111                      | 7111111111111111111111                      | 8111111111111111111111                      | 9111111111111111111111                     | 10111111111111111111111                     |
| D.U.F. NO.  | 11111111111111111111111                     | 21111111111111111111111                     | 31111111111111111111111                     | 41111111111111111111111                     | 51111111111111111111111                     | 61111111111111111111111                     | 71111111111111111111111                     | 81111111111111111111111                     | 91111111111111111111111                    | 101111111111111111111111                    |
| D.U.F. NO.  | 111111111111111111111111                    | 211111111111111111111111                    | 311111111111111111111111                    | 411111111111111111111111                    | 511111111111111111111111                    | 611111111111111111111111                    | 711111111111111111111111                    | 811111111111111111111111                    | 911111111111111111111111                   | 1011111111111111111111111                   |
| D.U.F. NO.  | 1111111111111111111111111                   | 2111111111111111111111111                   | 3111111111111111111111111                   | 4111111111111111111111111                   | 5111111111111111111111111                   | 6111111111111111111111111                   | 7111111111111111111111111                   | 8111111111111111111111111                   | 9111111111111111111111111                  | 10111111111111111111111111                  |
| D.U.F. NO.  | 11111111111111111111111111                  | 21111111111111111111111111                  | 31111111111111111111111111                  | 41111111111111111111111111                  | 51111111111111111111111111                  | 61111111111111111111111111                  | 71111111111111111111111111                  | 81111111111111111111111111                  | 91111111111111111111111111                 | 101111111111111111111111111                 |
| D.U.F. NO.  | 111111111111111111111111111                 | 211111111111111111111111111                 | 311111111111111111111111111                 | 411111111111111111111111111                 | 511111111111111111111111111                 | 611111111111111111111111111                 | 711111111111111111111111111                 | 811111111111111111111111111                 | 911111111111111111111111111                | 1011111111111111111111111111                |
| D.U.F. NO.  | 1111111111111111111111111111                | 2111111111111111111111111111                | 3111111111111111111111111111                | 4111111111111111111111111111                | 5111111111111111111111111111                | 6111111111111111111111111111                | 7111111111111111111111111111                | 8111111111111111111111111111                | 9111111111111111111111111111               | 10111111111111111111111111111               |
| D.U.F. NO.  | 11111111111111111111111111111               | 21111111111111111111111111111               | 31111111111111111111111111111               | 41111111111111111111111111111               | 51111111111111111111111111111               | 61111111111111111111111111111               | 71111111111111111111111111111               | 81111111111111111111111111111               | 91111111111111111111111111111              | 101111111111111111111111111111              |
| D.U.F. NO.  | 111111111111111111111111111111              | 211111111111111111111111111111              | 311111111111111111111111111111              | 411111111111111111111111111111              | 511111111111111111111111111111              | 611111111111111111111111111111              | 711111111111111111111111111111              | 811111111111111111111111111111              | 911111111111111111111111111111             | 1011111111111111111111111111111             |
| D.U.F. NO.  | 1111111111111111111111111111111             | 2111111111111111111111111111111             | 3111111111111111111111111111111             | 4111111111111111111111111111111             | 5111111111111111111111111111111             | 6111111111111111111111111111111             | 7111111111111111111111111111111             | 8111111111111111111111111111111             | 9111111111111111111111111111111            | 10111111111111111111111111111111            |
| D.U.F. NO.  | 11111111111111111111111111111111            | 21111111111111111111111111111111            | 31111111111111111111111111111111            | 41111111111111111111111111111111            | 51111111111111111111111111111111            | 61111111111111111111111111111111            | 71111111111111111111111111111111            | 81111111111111111111111111111111            | 91111111111111111111111111111111           | 101111111111111111111111111111111           |
| D.U.F. NO.  | 111111111111111111111111111111111           | 211111111111111111111111111111111           | 311111111111111111111111111111111           | 411111111111111111111111111111111           | 511111111111111111111111111111111           | 611111111111111111111111111111111           | 711111111111111111111111111111111           | 811111111111111111111111111111111           | 911111111111111111111111111111111          | 1011111111111111111111111111111111          |
| D.U.F. NO.  | 1111111111111111111111111111111111          | 2111111111111111111111111111111111          | 3111111111111111111111111111111111          | 4111111111111111111111111111111111          | 5111111111111111111111111111111111          | 6111111111111111111111111111111111          | 7111111111111111111111111111111111          | 8111111111111111111111111111111111          | 9111111111111111111111111111111111         | 10111111111111111111111111111111111         |
| D.U.F. NO.  | 11111111111111111111111111111111111         | 21111111111111111111111111111111111         | 31111111111111111111111111111111111         | 41111111111111111111111111111111111         | 51111111111111111111111111111111111         | 61111111111111111111111111111111111         | 71111111111111111111111111111111111         | 81111111111111111111111111111111111         | 91111111111111111111111111111111111        | 101111111111111111111111111111111111        |
| D.U.F. NO.  | 111111111111111111111111111111111111        | 211111111111111111111111111111111111        | 311111111111111111111111111111111111        | 411111111111111111111111111111111111        | 511111111111111111111111111111111111        | 611111111111111111111111111111111111        | 711111111111111111111111111111111111        | 811111111111111111111111111111111111        | 911111111111111111111111111111111111       | 1011111111111111111111111111111111111       |
| D.U.F. NO.  | 1111111111111111111111111111111111111       | 2111111111111111111111111111111111111       | 3111111111111111111111111111111111111       | 4111111111111111111111111111111111111       | 5111111111111111111111111111111111111       | 6111111111111111111111111111111111111       | 7111111111111111111111111111111111111       | 8111111111111111111111111111111111111       | 9111111111111111111111111111111111111      | 10111111111111111111111111111111111111      |
| D.U.F. NO.  | 11111111111111111111111111111111111111      | 21111111111111111111111111111111111111      | 31111111111111111111111111111111111111      | 41111111111111111111111111111111111111      | 51111111111111111111111111111111111111      | 61111111111111111111111111111111111111      | 71111111111111111111111111111111111111      | 81111111111111111111111111111111111111      | 91111111111111111111111111111111111111     | 101111111111111111111111111111111111111     |
| D.U.F. NO.  | 111111111111111111111111111111111111111     | 211111111111111111111111111111111111111     | 311111111111111111111111111111111111111     | 411111111111111111111111111111111111111     | 511111111111111111111111111111111111111     | 611111111111111111111111111111111111111     | 711111111111111111111111111111111111111     | 811111111111111111111111111111111111111     | 911111111111111111111111111111111111111    | 1011111111111111111111111111111111111111    |
| D.U.F. NO.  | 11    | 2111111111111111111111111111111111111111    | 3111111111111111111111111111111111111111    | 4111111111111111111111111111111111111111    | 5111111111111111111111111111111111111111    | 6111111111111111111111111111111111111111    | 7111111111111111111111111111111111111111    | 8111111111111111111111111111111111111111    | 9111111111111111111111111111111111111111   | 10111111111111111111111111111111111111111   |
| D.U.F. NO.  | 111   | 211   | 311   | 411   | 511   | 611   | 711   | 811   | 911  | 1011  |
| D.U.F. NO.  | 11  | 2111  | 3111  | 4111  | 5111  | 6111  | 7111  | 8111  | 9111 | 10111 |
| D.U.F. NO.  | 111 | 211 | 311 | 411 | 511 | 611 | 711 | 811 | 9111111111111111111111111111111111111111   |   |

A18

NO ERRORS OR WARNINGS IN THIS PHASE

\*\*\*FREEDOM GENERATION FOR SOLUTION COMPLETED\*\*\*

\*\*\*\* MAX SIZE OF BASE USED 1066  
SET 10 5000

DOCUMENT THURB(O/ANSA)

A20

PPPPPP AAAAAA FFFFFF EEEEE CCCCC  
P P A A FF E C CC  
P P A A FF E C CC  
P P A A FF E C CC  
PPPPPP AAAAAA FFFFFF EEEEE CCCCC  
PP AA A F EE C  
PP AA A F EE C  
PP AA A F EE C  
PP AA A F EE C  
PP AA A F EE C  
PP AA A F EEEEE CCCCC  
//7777 555555  
// / 55  
// / 55  
// / 55  
// / 55  
//7 555555

LEVEL 1.5 - OCTOBER 1977

\*\*\*\*\*  
\* TITLE CHECK ON PAFBLUCKS FOR SPHERE \*  
\* PHASE NUMBER 6 STATUS HERE \*  
\*\*\*\*\*

| ELEMENT<br>NUMBER | GROUP<br>NUMBER | ELEMENT<br>TYPE | PROPERTY<br>NUMBER | MATERIAL<br>NUMBER |
|-------------------|-----------------|-----------------|--------------------|--------------------|
| 1                 | 1               | 56210           | 4                  | 4                  |
| 2                 | 1               | 56210           | 4                  | 4                  |
| 3                 | 1               | 56210           | 4                  | 4                  |
| 4                 | 1               | 56210           | 4                  | 4                  |
| 5                 | 1               | 56210           | 4                  | 4                  |
| 6                 | 1               | 56210           | 4                  | 4                  |
| 7                 | 1               | 56210           | 4                  | 4                  |
| 8                 | 1               | 56210           | 4                  | 4                  |
| 9                 | 1               | 56210           | 4                  | 4                  |
| 10                | 1               | 56210           | 4                  | 4                  |
| 11                | 1               | 56210           | 4                  | 4                  |
| 12                | 1               | 56210           | 4                  | 4                  |
| 13                | 1               | 56210           | 4                  | 4                  |
| 14                | 1               | 56210           | 4                  | 4                  |
| 15                | 1               | 56210           | 4                  | 4                  |
| 16                | 1               | 56210           | 4                  | 4                  |
| 17                | 1               | 56210           | 4                  | 4                  |
| 18                | 1               | 56210           | 4                  | 4                  |

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62

A21

|    |   |       |   |   |
|----|---|-------|---|---|
| 19 | 1 | 36210 | 4 | 4 |
| 20 | 1 | 36210 | 4 | 4 |
| 21 | 1 | 36210 | 4 | 4 |
| 22 | 1 | 36210 | 4 | 4 |
| 23 | 1 | 36210 | 4 | 4 |
| 24 | 1 | 36210 | 4 | 4 |
| 25 | 1 | 36210 | 4 | 4 |
| 26 | 1 | 36210 | 4 | 4 |
| 27 | 1 | 36210 | 4 | 4 |
| 28 | 1 | 36210 | 4 | 4 |
| 29 | 1 | 36210 | 4 | 4 |
| 30 | 1 | 36210 | 4 | 4 |

NO ERRORS OR WARNINGS IN THIS PHASE

\*\*\*\* END OF ELEMENT MATRIX GENERATION \*\*\*\*

\*\*\*\* MAX SIZE OF BASE USED 1051  
SET TO 5000

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62



62

PHASE NUMBER 7 STAKIS HERE

A24

SCALED COORDINATES  
DIVIDE BY 1.0000

SCALED DISPLACEMENTS/ROTATIONS FOR LOAD CASE 1  
\* INDICATES A CONSTRAINT HAS BEEN APPLIED

DIVIDE BY 0.10000E U0  
NUDES 1- 30

| COORDINATES |        |   | DISPLACEMENTS |         |    | ROTATIONS |      |
|-------------|--------|---|---------------|---------|----|-----------|------|
| X           | Y      | Z | UX            | UY      | UZ | PHIV      | PHI2 |
| -0.9500     | 0.0000 |   | 1.9858        | *       |    |           |      |
| -1.0000     | 0.0000 |   | 1.8932        | *       |    |           |      |
| 0.0000      | 0.9500 |   | *             |         |    |           |      |
| 0.0000      | 1.0000 |   |               | -1.9801 |    |           |      |
| 0.9500      | 0.0000 |   |               | -1.8076 |    |           |      |
| 1.0000      | 0.0000 |   | -1.9858       | *       |    |           |      |
| -0.9985     | 0.0524 |   | -1.8932       | *       |    |           |      |
| -0.9944     | 0.1046 |   | 1.8917        | *       |    |           |      |
| -0.9875     | 0.1565 |   | 1.8052        | *       |    |           |      |
| -0.9780     | 0.2079 |   | 1.8730        | *       |    |           |      |
| -0.9658     | 0.2586 |   | 1.8546        | *       |    |           |      |
| -0.9509     | 0.3090 |   | 1.8303        | *       |    |           |      |
| -0.9335     | 0.3584 |   | 1.8004        | *       |    |           |      |
| -0.9135     | 0.4067 |   | 1.7655        | *       |    |           |      |
| -0.8910     | 0.4540 |   | 1.7258        | *       |    |           |      |
| -0.8660     | 0.5000 |   | 1.6817        | *       |    |           |      |
| -0.8387     | 0.5446 |   | 1.6334        | *       |    |           |      |
| -0.8091     | 0.5876 |   | 1.5812        | *       |    |           |      |
| -0.7772     | 0.6293 |   | 1.5250        | *       |    |           |      |
| -0.7432     | 0.6691 |   | 1.4649        | *       |    |           |      |
| -0.7072     | 0.7071 |   | 1.4011        | *       |    |           |      |
| -0.6692     | 0.7431 |   | 1.3335        | *       |    |           |      |
| -0.6294     | 0.7771 |   | 1.2623        | *       |    |           |      |
| -0.5878     | 0.8090 |   | 1.1875        | *       |    |           |      |
| -0.5446     | 0.8387 |   | 1.1095        | *       |    |           |      |
| -0.5000     | 0.8660 |   | 1.0283        | *       |    |           |      |
| -0.4540     | 0.8910 |   | 0.9441        | *       |    |           |      |
| -0.4067     | 0.9135 |   | 0.8573        | *       |    |           |      |
| -0.3585     | 0.9336 |   | 0.7661        | *       |    |           |      |
| -0.3090     | 0.9511 |   | 0.6767        | *       |    |           |      |
| -0.2586     | 0.9659 |   | 0.5834        | *       |    |           |      |
| -0.2079     | 0.9781 |   | 0.4886        | *       |    |           |      |
| -0.1564     | 0.9877 |   | 0.3924        | *       |    |           |      |
| -0.1045     | 0.9945 |   | 0.2952        | *       |    |           |      |
| -0.0523     | 0.9986 |   | 0.1973        | *       |    |           |      |
| 0.0000      | 1.0000 |   | 0.0988        | *       |    |           |      |
| 0.0523      | 0.9986 |   | -0.0000       | *       |    |           |      |
| 0.1045      | 0.9945 |   | -0.1073       | *       |    |           |      |
| 0.1564      | 0.9877 |   | -0.2052       | *       |    |           |      |
| 0.2079      | 0.9781 |   | -0.2924       | *       |    |           |      |
| 0.2586      | 0.9659 |   | -0.3686       | *       |    |           |      |
| 0.3090      | 0.9511 |   | -0.4341       | *       |    |           |      |
| 0.3585      | 0.9336 |   | -0.4886       | *       |    |           |      |
| 0.4067      | 0.9135 |   | -0.5334       | *       |    |           |      |
| 0.4540      | 0.8910 |   | -0.5667       | *       |    |           |      |
| 0.5000      | 0.8660 |   | -0.5941       | *       |    |           |      |
| 0.5446      | 0.8387 |   | -0.6163       | *       |    |           |      |
| 0.5878      | 0.8090 |   | -0.6335       | *       |    |           |      |
| 0.6294      | 0.7771 |   | -0.6463       | *       |    |           |      |
| 0.6692      | 0.7431 |   | -0.6541       | *       |    |           |      |

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62

SCALED COORDINATES  
DIVIDE BY 1.00000

SCALED DISPLACEMENTS/ROTATIONS FOR LOAD CASE 1  
\* INDICATES A CONSTRAINT HAS BEEN APPLIED

DIVIDE BY 0.10000E 00  
NODES 50= 99

| COORDINATES |         |   | NODE NO. | DISPLACEMENTS |         |    | ROTATIONS |      |
|-------------|---------|---|----------|---------------|---------|----|-----------|------|
| X           | Y       | Z |          | UX            | UY      | UZ | PHIV      | PHIZ |
| 0.7072      | 0.7071  |   | 50       | -1.5535       | -1.5530 |    |           |      |
| 0.7432      | 0.6691  |   | 51       | -1.4011       | -1.2610 |    |           |      |
| 0.7772      | 0.6293  |   | 52       | -1.4049       | -1.1856 |    |           |      |
| 0.8091      | 0.5878  |   | 53       | -1.5250       | -1.1072 |    |           |      |
| 0.8387      | 0.5446  |   | 54       | -1.5812       | -1.0261 |    |           |      |
| 0.8660      | 0.5000  |   | 55       | -1.6334       | -0.9423 |    |           |      |
| 0.8910      | 0.4540  |   | 56       | -1.6817       | -0.8562 |    |           |      |
| 0.9135      | 0.4067  |   | 57       | -1.7258       | -0.7678 |    |           |      |
| 0.9355      | 0.3584  |   | 58       | -1.7655       | -0.6772 |    |           |      |
| 0.9509      | 0.3090  |   | 59       | -1.8004       | -0.5845 |    |           |      |
| 0.9658      | 0.2586  |   | 60       | -1.8303       | -0.4899 |    |           |      |
| 0.9780      | 0.2079  |   | 61       | -1.8546       | -0.3936 |    |           |      |
| 0.9875      | 0.1565  |   | 62       | -1.8730       | -0.2959 |    |           |      |
| 0.9944      | 0.1046  |   | 63       | -1.8852       | -0.1972 |    |           |      |
| 0.9965      | 0.0524  |   | 64       | -1.8917       | -0.0984 |    |           |      |
| -0.9750     | -0.0000 |   | 65       | 1.9568        | *       |    |           |      |
| -0.9695     | 0.1019  |   | 66       | 1.9288        | -0.2023 |    |           |      |
| -0.9555     | 0.2027  |   | 67       | 1.8977        | -0.4023 |    |           |      |
| -0.9272     | 0.3015  |   | 68       | 1.8425        | -0.5971 |    |           |      |
| -0.8900     | 0.3966  |   | 69       | 1.7662        | -0.7847 |    |           |      |
| -0.8444     | 0.4875  |   | 70       | 1.6716        | -0.9637 |    |           |      |
| -0.7888     | 0.5731  |   | 71       | 1.5604        | -1.1329 |    |           |      |
| -0.7246     | 0.6524  |   | 72       | 1.4334        | -1.2904 |    |           |      |
| -0.6524     | 0.7246  |   | 73       | 1.2915        | -1.4343 |    |           |      |
| -0.5731     | 0.7888  |   | 74       | 1.1350        | -1.5627 |    |           |      |
| -0.4875     | 0.8444  |   | 75       | 0.9659        | -1.6735 |    |           |      |
| -0.3966     | 0.8907  |   | 76       | 0.7859        | -1.7656 |    |           |      |
| -0.3015     | 0.9275  |   | 77       | 0.5971        | -1.8378 |    |           |      |
| -0.2027     | 0.9537  |   | 78       | 0.4017        | -1.8897 |    |           |      |
| -0.1019     | 0.9697  |   | 79       | 0.2019        | -1.9209 |    |           |      |
| 0.0000      | 0.9750  |   | 80       | *             | -1.9314 |    |           |      |
| 0.1019      | 0.9697  |   | 81       | -0.2019       | -1.9209 |    |           |      |
| 0.2027      | 0.9537  |   | 82       | -0.4017       | -1.8897 |    |           |      |
| 0.3015      | 0.9275  |   | 83       | -0.5971       | -1.8378 |    |           |      |
| 0.3966      | 0.8907  |   | 84       | -0.7859       | -1.7656 |    |           |      |
| 0.4875      | 0.8444  |   | 85       | -0.9659       | -1.6735 |    |           |      |
| 0.5731      | 0.7888  |   | 86       | -1.1350       | -1.5627 |    |           |      |
| 0.6524      | 0.7246  |   | 87       | -1.2915       | -1.4343 |    |           |      |
| 0.7246      | 0.6524  |   | 88       | -1.4334       | -1.2904 |    |           |      |
| 0.7888      | 0.5731  |   | 89       | -1.5604       | -1.1329 |    |           |      |
| 0.8444      | 0.4875  |   | 90       | -1.6716       | -0.9637 |    |           |      |
| 0.8906      | 0.3966  |   | 91       | -1.7662       | -0.7847 |    |           |      |
| 0.9272      | 0.3015  |   | 92       | -1.8425       | -0.5971 |    |           |      |
| 0.9555      | 0.2027  |   | 93       | -1.8977       | -0.4023 |    |           |      |
| 0.9695      | 0.1019  |   | 94       | -1.9288       | -0.2023 |    |           |      |
| 0.9750      | -0.0000 |   | 95       | -1.9568       | *       |    |           |      |
| -0.9486     | 0.0457  |   | 96       | 1.9041        | -0.1044 |    |           |      |
| -0.9440     | 0.0995  |   | 97       | 1.9772        | -0.2080 |    |           |      |
| -0.9381     | 0.1486  |   | 98       | 1.9645        | -0.3105 |    |           |      |

SCALED COORDINATES  
DIVIDE BY 1.0000

SCALED DISPLACEMENTS/ROTATIONS FOR LOAD CASE 1  
\* INDICATES A CONSTRAINT HAS BEEN APPLIED

DIVIDE BY 0.100000 U6  
NODES 99- 148

COORDINATES  
X Y Z

DISPLACEMENTS  
UX UY UZ

ROTATIONS  
PHIX PHIV PHIZ

NODE  
NO.

Z

Y

X

|         |        |         |         |     |
|---------|--------|---------|---------|-----|
| -0.9291 | 0.1975 | 0.19434 | -0.4121 | 99  |
| -0.9175 | 0.4459 | 1.9202  | -0.5124 | 100 |
| -0.9034 | 0.4936 | 1.8891  | -0.6112 | 101 |
| -0.8868 | 0.5405 | 1.8526  | -0.7084 | 102 |
| -0.8678 | 0.5864 | 1.8111  | -0.8036 | 103 |
| -0.8464 | 0.6315 | 1.7648  | -0.8968 | 104 |
| -0.8227 | 0.6750 | 1.7141  | -0.9876 | 105 |
| -0.7968 | 0.7174 | 1.6591  | -1.0759 | 106 |
| -0.7686 | 0.7584 | 1.5999  | -1.1614 | 107 |
| -0.7385 | 0.7978 | 1.5366  | -1.2439 | 108 |
| -0.7060 | 0.8357 | 1.4695  | -1.3232 | 109 |
| -0.6718 | 0.8717 | 1.3984  | -1.3989 | 110 |
| -0.6357 | 0.9060 | 1.3236  | -1.4708 | 111 |
| -0.5979 | 0.9385 | 1.2452  | -1.5386 | 112 |
| -0.5584 | 0.9686 | 1.1634  | -1.6022 | 113 |
| -0.5174 | 0.9967 | 1.0782  | -1.6613 | 114 |
| -0.4750 | 0.9227 | 0.9901  | -1.7158 | 115 |
| -0.4315 | 0.8465 | 0.8992  | -1.7654 | 116 |
| -0.3864 | 0.7679 | 0.8057  | -1.8101 | 117 |
| -0.3404 | 0.6869 | 0.7099  | -1.8497 | 118 |
| -0.2935 | 0.6035 | 0.6122  | -1.8841 | 119 |
| -0.2459 | 0.5176 | 0.5126  | -1.9134 | 120 |
| -0.1975 | 0.4292 | 0.4119  | -1.9373 | 121 |
| -0.1486 | 0.3385 | 0.3099  | -1.9560 | 122 |
| -0.0995 | 0.2448 | 0.2071  | -1.9694 | 123 |
| -0.0497 | 0.1487 | 0.1057  | -1.9774 | 124 |
| 0.0000  | 0.0487 | 0.0000  | -1.9774 | 125 |
| 0.0495  | 0.9448 | -0.2071 | -1.9694 | 126 |
| 0.1486  | 0.8485 | -0.5099 | -1.9560 | 127 |
| 0.2459  | 0.7492 | -0.8119 | -1.9373 | 128 |
| 0.3404  | 0.6476 | -1.1134 | -1.9134 | 129 |
| 0.4315  | 0.5435 | -1.3841 | -1.8841 | 130 |
| 0.5174  | 0.4385 | -1.6357 | -1.8497 | 131 |
| 0.5979  | 0.3335 | -1.8841 | -1.8101 | 132 |
| 0.6718  | 0.2285 | -2.1158 | -1.7654 | 133 |
| 0.7385  | 0.1235 | -2.3432 | -1.7158 | 134 |
| 0.7968  | 0.0185 | -2.5666 | -1.6613 | 135 |
| 0.8464  | 0.9144 | -2.7899 | -1.6022 | 136 |
| 0.8868  | 0.8104 | -3.0134 | -1.5386 | 137 |
| 0.9175  | 0.7064 | -3.2366 | -1.4708 | 138 |
| 0.9487  | 0.6024 | -3.4599 | -1.3989 | 139 |
| 0.9799  | 0.4984 | -3.6832 | -1.3232 | 140 |
| 1.0111  | 0.3944 | -3.9066 | -1.2439 | 141 |
| 1.0423  | 0.2904 | -4.1299 | -1.1614 | 142 |
| 1.0735  | 0.1864 | -4.3532 | -1.0759 | 143 |
| 1.1047  | 0.0824 | -4.5766 | -0.9876 | 144 |
| 1.1359  | 0.9784 | -4.7999 | -0.8968 | 145 |
| 1.1671  | 0.8744 | -5.0232 | -0.8036 | 146 |
| 1.1983  | 0.7704 | -5.2466 | -0.7084 | 147 |

SCALED COORDINATES  
DIVIDE BY 1.0000

COORDINATES  
X Y Z

NODE  
NO.

0.9034 0.2936  
0.9175 0.2659  
0.9291 0.1975  
0.9381 0.1486  
0.9446 0.0993  
0.9486 0.0497

148  
149  
150  
151  
152  
153

SCALED DISPLACEMENTS/ROTATIONS FOR LOAD CASE 1  
\* INDICATES A CONSTRAINT HAS BEEN APPLIED

DISPLACEMENTS  
UX UY UZ

PHIX

ROTATIONS  
PHIY PHIZ

-1.8891  
-1.9202  
-1.9454  
-1.9645  
-1.9772  
-1.9861  
-0.6112  
-0.5124  
-0.4121  
-0.3105  
-0.2080  
-0.1044

END OF PHASE 1

\*\*\* MAX SIZE OF BASE USED 1/59  
SFT 10 5000

NO ERRORS OR WARNINGS IN THIS PHASE



| 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

A30

| 5.  | 10 | 12 | 94  | 101 | 11 | 67 | 68 | 100 |
|-----|----|----|-----|-----|----|----|----|-----|
| 4.  | 12 | 14 | 101 | 103 | 13 | 68 | 69 | 102 |
| 5.  | 14 | 16 | 103 | 105 | 15 | 69 | 70 | 104 |
| 6.  | 16 | 18 | 105 | 107 | 17 | 70 | 71 | 106 |
| 7.  | 18 | 20 | 107 | 109 | 19 | 71 | 72 | 108 |
| 8.  | 20 | 22 | 109 | 111 | 21 | 72 | 73 | 110 |
| 9.  | 22 | 24 | 111 | 113 | 23 | 73 | 74 | 112 |
| 10. | 24 | 26 | 113 | 115 | 25 | 74 | 75 | 114 |
| 11. | 26 | 28 | 115 | 117 | 27 | 75 | 76 | 116 |
| 12. | 28 | 30 | 117 | 119 | 29 | 76 | 77 | 118 |
| 13. | 30 | 32 | 119 | 121 | 31 | 77 | 78 | 120 |
| 14. | 32 | 34 | 121 | 123 | 33 | 78 | 79 | 122 |
| 15. | 34 | 4  | 123 | 3   | 35 | 79 | 80 | 124 |
| 16. | 4  | 37 | 3   | 126 | 36 | 80 | 81 | 125 |
| 17. | 37 | 39 | 126 | 128 | 38 | 81 | 82 | 127 |
| 18. | 39 | 41 | 128 | 130 | 40 | 82 | 83 | 129 |
| 19. | 41 | 43 | 130 | 132 | 42 | 83 | 84 | 131 |
| 20. | 43 | 45 | 132 | 134 | 44 | 84 | 85 | 133 |
| 21. | 45 | 47 | 134 | 136 | 46 | 85 | 86 | 135 |
| 22. | 47 | 49 | 136 | 138 | 48 | 86 | 87 | 137 |
| 23. | 49 | 51 | 138 | 140 | 50 | 87 | 88 | 139 |
| 24. | 51 | 53 | 140 | 142 | 52 | 88 | 89 | 141 |
| 25. | 53 | 55 | 142 | 144 | 54 | 89 | 90 | 143 |
| 26. | 55 | 57 | 144 | 146 | 56 | 90 | 91 | 145 |
| 27. | 57 | 59 | 146 | 148 | 58 | 91 | 92 | 147 |
| 28. | 59 | 61 | 148 | 150 | 60 | 92 | 93 | 149 |
| 29. | 61 | 63 | 150 | 152 | 62 | 93 | 94 | 151 |
| 30. | 63 | 6  | 152 | 5   | 64 | 94 | 95 | 153 |

SCALE OF DRAWING IS 0.0859 TO 1

POTNIS ARRAY

| NODE | PAPER | COORDINATES | 2     | 3      | 4      | 5      | 6     | 7      | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15     | 16     | 17     | 18     | 19     | 20     | 21     | 22     | 23     | 24     | 25     | 26     | 27     | 28     | 29     | 30     | 31     | 32     | 33     | 34     | 35     | 36     | 37     | 38     | 39     | 40     | 41     | 42     | 43     | 44     | 45     | 46     | 47     | 48     | 49     | 50     | 51     | 52     | 53     | 54     | 55     | 56     | 57     | 58     | 59     | 60     | 61     | 62     | 63     | 64     | 65     | 66     | 67     | 68     | 69     | 70     | 71     | 72     | 73     | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 |
|------|-------|-------------|-------|--------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|----|----|----|----|----|----|----|----|----|----|----|
| 1    | 3.429 | 26.540      | 3.000 | 26.540 | 11.586 | 19.742 | 3.068 | 27.438 | 3.421 | 5.936 | 4.639 | 5.514 | 6.519 | 7.608 | 8.933 | 10.243 | 11.539 | 12.835 | 14.131 | 15.427 | 16.723 | 18.019 | 19.315 | 20.611 | 21.907 | 23.203 | 24.499 | 25.795 | 27.091 | 28.387 | 29.683 | 30.979 | 32.275 | 33.571 | 34.867 | 36.163 | 37.459 | 38.755 | 40.051 | 41.347 | 42.643 | 43.939 | 45.235 | 46.531 | 47.827 | 49.123 | 50.419 | 51.715 | 53.011 | 54.307 | 55.603 | 56.899 | 58.195 | 59.491 | 60.787 | 62.083 | 63.379 | 64.675 | 65.971 | 67.267 | 68.563 | 69.859 | 71.155 | 72.451 | 73.747 | 75.043 | 76.339 | 77.635 | 78.931 | 80.227 | 81.523 | 82.819 | 84.115 | 85.411 |    |    |    |    |    |    |    |    |    |    |    |    |

A31

|     |        |        |        |        |     |        |        |     |        |        |
|-----|--------|--------|--------|--------|-----|--------|--------|-----|--------|--------|
| 86  | 17.807 | 32.141 | 16.206 | 33.512 | 86  | 16.206 | 33.512 | 86  | 16.187 | 34.761 |
| 91  | 19.232 | 29.945 | 18.358 | 31.460 | 89  | 18.358 | 31.460 | 90  | 18.835 | 30.725 |
| 94  | 19.909 | 27.415 | 19.546 | 29.127 | 92  | 19.546 | 29.127 | 93  | 19.772 | 28.261 |
| 97  | 3.475  | 27.593 | 19.956 | 26.540 | 95  | 19.956 | 26.540 | 96  | 5.441  | 26.967 |
| 100 | 3.709  | 28.651 | 3.531  | 27.816 | 98  | 3.531  | 27.816 | 99  | 5.609  | 26.436 |
| 103 | 4.135  | 29.958 | 5.850  | 29.061 | 101 | 5.850  | 29.061 | 102 | 5.972  | 29.465 |
| 106 | 4.745  | 30.982 | 4.518  | 30.243 | 104 | 4.518  | 30.243 | 105 | 4.522  | 30.010 |
| 109 | 5.524  | 31.998 | 4.987  | 31.534 | 107 | 4.987  | 31.534 | 108 | 5.247  | 31.975 |
| 112 | 6.452  | 32.879 | 5.818  | 32.507 | 110 | 5.818  | 32.507 | 111 | 6.128  | 32.807 |
| 115 | 7.207  | 33.604 | 6.791  | 33.159 | 113 | 6.791  | 33.159 | 114 | 7.143  | 33.390 |
| 118 | 8.663  | 34.155 | 7.883  | 33.807 | 116 | 7.883  | 33.807 | 117 | 8.268  | 33.991 |
| 121 | 9.890  | 34.518 | 9.065  | 34.297 | 119 | 9.065  | 34.297 | 120 | 9.475  | 34.818 |
| 124 | 11.159 | 34.085 | 10.510 | 34.596 | 122 | 10.510 | 34.596 | 123 | 10.735 | 34.832 |
| 127 | 12.861 | 34.596 | 12.012 | 34.605 | 125 | 12.012 | 34.605 | 126 | 12.458 | 34.832 |
| 130 | 14.106 | 34.297 | 13.281 | 34.518 | 128 | 13.281 | 34.518 | 129 | 13.696 | 34.610 |
| 133 | 15.288 | 33.807 | 14.508 | 34.155 | 131 | 14.508 | 34.155 | 132 | 14.903 | 33.991 |
| 136 | 16.380 | 33.159 | 15.604 | 33.603 | 134 | 15.604 | 33.603 | 135 | 16.043 | 34.801 |
| 139 | 17.553 | 32.507 | 16.719 | 32.879 | 137 | 16.719 | 32.879 | 138 | 17.043 | 34.801 |
| 142 | 18.184 | 31.534 | 17.647 | 31.998 | 140 | 17.647 | 31.998 | 141 | 17.924 | 31.975 |
| 145 | 18.053 | 30.243 | 18.426 | 30.962 | 143 | 18.426 | 30.962 | 144 | 18.649 | 30.010 |
| 148 | 19.341 | 29.061 | 19.036 | 29.857 | 146 | 19.036 | 29.857 | 147 | 19.199 | 29.465 |
| 151 | 19.040 | 27.816 | 19.463 | 28.651 | 149 | 19.463 | 28.651 | 150 | 19.582 | 28.436 |
| 154 |        |        | 19.696 | 27.593 | 152 | 19.696 | 27.593 | 153 | 19.750 | 26.967 |

PARAMETERS IN CALLS TO LIMITS AND REGION ARE (0.0, 35.638, 0.0, 60.00)

RIV250 ENRIKED - DETERMINES POINTS ARRAY FOR DISPLACED SHAPE PLOT .  
 LARGEST DISPLACEMENT IN SIMUCIURE = 0.19889E-04 AT NODE NUMBER 151

SCALE OF DISPLACEMENTS IS 0.994E-05 X 1

## POINTS ARRAY FOR DISPLACED STRUCTURE

| NODE | PAPER  | COORDINATES | 2      | 5      | 8      | 11     | 14     | 17     | 20     | 23     | 26     | 29     | 32     | 35     | 38     | 41     | 44     | 47     | 50     | 53     | 56     | 59     | 62     | 65     | 68     | 71     | 74     | 77     |
|------|--------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1    | 5.426  | 26.540      | 4.904  | 26.540 | 17.745 | 27.259 | 28.270 | 29.260 | 30.184 | 31.017 | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 |
| 4    | 11.585 | 35.227      | 17.745 | 26.540 | 17.745 | 27.259 | 28.270 | 29.260 | 30.184 | 31.017 | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 |
| 7    | 4.915  | 26.891      | 5.134  | 27.259 | 5.134  | 28.270 | 29.260 | 30.184 | 31.017 | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 |
| 10   | 5.054  | 27.930      | 5.478  | 29.260 | 5.478  | 30.184 | 31.017 | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 |
| 13   | 5.360  | 28.936      | 5.975  | 30.184 | 5.975  | 31.017 | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 |
| 16   | 5.793  | 29.685      | 6.614  | 31.017 | 6.614  | 31.758 | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 |
| 19   | 6.586  | 30.751      | 7.576  | 31.758 | 7.576  | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 |
| 22   | 7.110  | 31.511      | 8.422  | 32.148 | 8.422  | 32.531 | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 |
| 25   | 7.943  | 32.148      | 9.189  | 32.762 | 9.189  | 33.081 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 |
| 28   | 8.066  | 32.648      | 10.195 | 33.081 | 10.195 | 33.218 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 |
| 31   | 9.855  | 32.999      | 11.235 | 33.218 | 11.235 | 33.145 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 |
| 34   | 10.886 | 33.191      | 12.251 | 33.145 | 12.251 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 |
| 37   | 12.284 | 33.191      | 13.251 | 33.145 | 13.251 | 32.899 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 |
| 40   | 13.516 | 32.999      | 14.235 | 32.899 | 14.235 | 32.497 | 31.950 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 |
| 43   | 14.505 | 32.648      | 15.227 | 32.148 | 15.227 | 31.758 | 31.270 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 |
| 46   | 15.227 | 32.148      | 16.061 | 31.511 | 16.061 | 30.751 | 30.473 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  |
| 49   | 16.061 | 31.511      | 16.785 | 30.751 | 16.785 | 29.936 | 29.577 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  |
| 52   | 17.578 | 29.885      | 17.578 | 29.885 | 17.578 | 28.936 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  |
| 55   | 17.025 | 28.936      | 18.117 | 27.930 | 18.117 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |
| 58   | 17.025 | 28.936      | 18.117 | 27.930 | 18.117 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |
| 61   | 18.117 | 27.930      | 18.117 | 27.930 | 18.117 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |
| 64   | 18.256 | 26.891      | 18.256 | 26.891 | 18.256 | 26.540 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  | 5.464  |
| 67   | 5.507  | 27.876      | 19.040 | 27.816 | 19.040 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |
| 70   | 6.017  | 29.156      | 19.341 | 29.061 | 19.341 | 28.605 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  |
| 73   | 7.282  | 31.518      | 19.341 | 29.061 | 19.341 | 28.605 | 28.605 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  |
| 76   | 8.971  | 32.412      | 19.040 | 27.816 | 19.040 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |
| 79   | 10.914 | 32.933      | 19.040 | 27.816 | 19.040 | 27.566 | 27.566 | 26.540 | 25.526 | 24.521 | 23.518 | 22.515 | 21.512 | 20.509 | 19.506 | 18.503 | 17.500 | 16.497 | 15.494 | 14.491 | 13.488 | 12.485 | 11.482 | 10.479 | 9.476  | 8.473  | 7.470  | 6.467  |

A32

|     |        |        |     |        |        |     |        |        |
|-----|--------|--------|-----|--------|--------|-----|--------|--------|
| 82  | 12.422 | 32.028 | 80  | 11.585 | 32.909 | 81  | 12.257 | 34.433 |
| 85  | 14.649 | 32.106 | 83  | 13.571 | 32.653 | 84  | 14.200 | 34.412 |
| 88  | 16.565 | 30.044 | 86  | 15.564 | 31.741 | 87  | 15.868 | 31.516 |
| 91  | 17.456 | 29.156 | 89  | 16.689 | 30.321 | 90  | 17.154 | 29.736 |
| 94  | 17.969 | 27.212 | 92  | 17.693 | 28.526 | 93  | 17.864 | 27.876 |
| 97  | 5.464  | 27.184 | 95  | 18.009 | 26.540 | 96  | 5.437  | 29.862 |
| 100 | 5.639  | 28.136 | 98  | 5.507  | 27.504 | 99  | 5.565  | 27.862 |
| 103 | 5.850  | 29.049 | 101 | 5.729  | 28.446 | 102 | 5.853  | 28.751 |
| 106 | 6.413  | 29.900 | 104 | 6.093  | 29.341 | 105 | 6.246  | 29.625 |
| 109 | 7.001  | 30.667 | 107 | 6.595  | 30.166 | 108 | 6.742  | 30.422 |
| 112 | 7.604  | 31.331 | 110 | 7.224  | 30.901 | 111 | 7.439  | 31.122 |
| 115 | 8.503  | 31.878 | 113 | 7.961  | 31.527 | 114 | 8.227  | 31.710 |
| 118 | 9.577  | 32.294 | 116 | 8.687  | 32.032 | 117 | 9.078  | 32.171 |
| 121 | 10.504 | 32.570 | 119 | 9.681  | 32.402 | 120 | 9.970  | 32.494 |
| 124 | 11.463 | 32.697 | 122 | 10.621 | 32.649 | 123 | 10.941 | 32.871 |
| 127 | 12.549 | 32.629 | 125 | 11.908 | 32.697 | 126 | 12.230 | 33.071 |
| 130 | 13.490 | 32.432 | 128 | 12.667 | 32.510 | 129 | 13.190 | 33.494 |
| 133 | 14.344 | 32.032 | 131 | 13.794 | 32.294 | 132 | 14.092 | 33.171 |
| 136 | 15.210 | 31.927 | 134 | 14.668 | 31.878 | 135 | 14.945 | 31.710 |
| 139 | 15.947 | 30.901 | 137 | 15.566 | 31.531 | 138 | 15.712 | 31.122 |
| 142 | 16.575 | 30.166 | 140 | 16.169 | 30.667 | 141 | 16.379 | 30.422 |
| 145 | 17.076 | 29.541 | 143 | 16.758 | 29.900 | 144 | 16.975 | 29.625 |
| 148 | 17.442 | 28.446 | 146 | 17.415 | 29.049 | 147 | 17.336 | 28.751 |
| 151 | 17.664 | 27.504 | 149 | 17.552 | 28.156 | 150 | 17.606 | 27.862 |
|     |        |        | 152 | 17.707 | 27.104 | 153 | 17.734 | 26.862 |

\*\* END OF PAFEC DRAW PRINT OUT FOR PHASE 8 \*\*

NO ERRORS OR WARNINGS IN THIS PHASE

\*\*\* MAX SIZE OF BASE USED 2022  
SET TO 5000

AAH.UJCWB10

*[A vertical strip of decorative repeating patterns, likely from a book cover or endpaper.]*

#LISTING OF :AARC.TROB(Y/ANSA) PRODUCED ON 21MAR78 AT 08:45:06  
 #OUTPUT BY LISIPL IN :AAM.UUCWB70\* ON 21MAR78 AT 08:45:46 USING U16  
 DOCUMENT TROB(Y/ANSA)

LEVEL 1.3 - OCTOBER 1977

TITLE CHECK ON PAPERBLOCKS FOR SPHERE

PHASE NUMBER 9 STAKIS HERE

DEFAULT STRESS. FLEMEN'S MODULE CREATED IN W09130

SUBROUTINE RS6210 8 NODE ISOPARAMETRIC STRESSING ROUTINE

SUBROUTINE K50210 8 NODE ISOPARAMETRIC STRESSING ROUTINE  
SIGMA1 IS THE MAXIMUM VALUE OF STRESS IN THE PLANE, SIGMAC IS THE MINIMUM IN THE PLANE, SIGMA3 IS PERPENDICULAR TO THE PLANE (I.E. HOOP STRESS IN AXISYMMETRIC CASES), ALPHA IS THE ANGLE OF SIGMA1 MEASURED + TO THE Y-AXIS FROM THE ELEMENT X-AXIS, BETA IS THE ANGLE OF SIGMA1 TO THE GLOBAL X-AXIS, NVAL INDICATES THE ELEMENT IS NOT IN THE GLOBAL XY PLANE.

| ELE<br>NO | LOAD<br>CASE | **** THREE PRINCIPLE STRESSES **** |                         |             | MAX<br>SHEAR | ANGLE<br>OF SIG1<br>ALPHA | ANGLE<br>OF SIG2<br>BETA | GLOBAL COORDINATES OF |             | NODE<br>NO |
|-----------|--------------|------------------------------------|-------------------------|-------------|--------------|---------------------------|--------------------------|-----------------------|-------------|------------|
|           |              | IN PLANE<br>SIGMA 1                | OUT OF PLANE<br>SIGMA 2 | SIGMA 3     |              |                           |                          | POSITION              | COORDINATES |            |
| 1         | 1            | 0.4257E 06                         | -0.1081E 07             | -0.1176E 00 | 0.9032E 06   | 66.78                     | 0.13                     | -1.0000               | 0.0000      | 2          |
| 1         | 1            | 0.5887E 06                         | -0.1080E 07             | -0.5240E 05 | 0.9875E 06   | 66.78                     | 0.13                     | -0.9750               | 0.0000      | 65         |
| 1         | 1            | 0.1046E 07                         | -0.1105E 07             | -0.1805E 05 | 0.1075E 07   | 86.62                     | 0.09                     | -0.9500               | 0.0000      | 1          |
| 1         | 1            | -0.2055E 06                        | -0.2028E 07             | -0.2025E 07 | 0.9095E 06   | 69.95                     | -3.04                    | -0.9765               | 0.0000      | 1          |
| 1         | 1            | -0.1032E 06                        | -0.2075E 07             | -0.2075E 07 | 0.9078E 06   | 69.92                     | -3.01                    | -0.9756               | 0.0000      | -1         |
| 1         | 1            | -0.6553E 04                        | -0.2142E 07             | -0.2142E 07 | 0.2107E 07   | 89.94                     | -3.03                    | -0.9684               | 0.0000      | 96         |
| 1         | 1            | 0.2088E 06                         | -0.2040E 07             | -0.2054E 07 | 0.9158E 06   | -87.13                    | -3.96                    | -0.9944               | 0.0000      | 8          |
| 1         | 1            | -0.1038E 06                        | -0.2079E 07             | -0.2079E 07 | 0.9082E 06   | -87.14                    | -3.95                    | -0.9945               | 0.0000      | 66         |
| 1         | 1            | -0.7459E 04                        | -0.2135E 07             | -0.2140E 07 | 0.1066E 07   | -87.12                    | -3.97                    | -0.9446               | 0.0000      | 97         |
| 2         | 1            | -0.2091E 06                        | -0.2041E 07             | -0.2054E 07 | 0.9160E 06   | 86.98                     | -3.90                    | -0.9944               | 0.0000      | 8          |
| 2         | 1            | -0.2054E 06                        | -0.2041E 07             | -0.2050E 07 | 0.9082E 06   | 86.98                     | -3.90                    | -0.9945               | 0.0000      | 66         |

|   |   |             |             |             |            |        |        |         |        |        |     |
|---|---|-------------|-------------|-------------|------------|--------|--------|---------|--------|--------|-----|
| 2 | 1 | -0.6006E 04 | -0.4135E 07 | -0.2140E 07 | 0.1066E 07 | 86.99  | -6.00  | -0.9446 | 0.0993 | 0.0000 | 97  |
| 2 | 1 | -0.6091E 06 | -0.4042E 07 | -0.2056E 07 | 0.9165E 06 | 89.99  | -9.00  | -0.9475 | 0.1563 | 0.0000 | 9   |
| 2 | 1 | -0.1030E 06 | -0.4079E 07 | -0.2080E 07 | 0.9483E 06 | 89.99  | -8.99  | -0.9428 | 0.1526 | 0.0000 | -2  |
| 2 | 1 | -0.0590E 04 | -0.4130E 07 | -0.2156E 07 | 0.1065E 07 | 89.99  | -8.99  | -0.9361 | 0.1486 | 0.0000 | 98  |
| 2 | 1 | -0.6093E 06 | -0.4044E 07 | -0.2040E 07 | 0.9175E 06 | -87.02 | -11.98 | -0.9760 | 0.2079 | 0.0000 | 10  |
| 2 | 1 | -0.1033E 06 | -0.4080E 07 | -0.2060E 07 | 0.9483E 06 | -87.03 | -11.98 | -0.9535 | 0.2027 | 0.0000 | 67  |
| 2 | 1 | -0.6083E 04 | -0.4150E 07 | -0.2154E 07 | 0.1064E 07 | -87.03 | -11.98 | -0.9291 | 0.1975 | 0.0000 | 99  |
| 3 | 1 | -0.6086E 06 | -0.4043E 07 | -0.2040E 07 | 0.9172E 06 | 87.03  | -12.00 | -0.9720 | 0.2079 | 0.0000 | 10  |
| 3 | 1 | -0.1032E 06 | -0.4080E 07 | -0.2060E 07 | 0.9482E 06 | 87.03  | -12.00 | -0.9535 | 0.2027 | 0.0000 | 67  |
| 3 | 1 | -0.6082E 04 | -0.4131E 07 | -0.2152E 07 | 0.1064E 07 | 87.03  | -12.00 | -0.9291 | 0.1975 | 0.0000 | 99  |
| 3 | 1 | -0.6092E 06 | -0.4079E 07 | -0.2056E 07 | 0.9159E 06 | 90.00  | -14.97 | -0.9658 | 0.2509 | 0.0000 | 11  |
| 3 | 1 | -0.1030E 06 | -0.4079E 07 | -0.2079E 07 | 0.9480E 06 | -90.00 | -14.98 | -0.9416 | 0.2524 | 0.0000 | -3  |
| 3 | 1 | -0.6091E 04 | -0.4132E 07 | -0.2155E 07 | 0.1063E 07 | -90.00 | -14.97 | -0.9175 | 0.2459 | 0.0000 | 100 |
| 3 | 1 | -0.6096E 06 | -0.4039E 07 | -0.2056E 07 | 0.9149E 06 | -86.98 | -17.99 | -0.9509 | 0.5090 | 0.0000 | 12  |
| 3 | 1 | -0.1032E 06 | -0.4079E 07 | -0.2079E 07 | 0.9481E 06 | -86.98 | -17.99 | -0.9272 | 0.5013 | 0.0000 | 68  |
| 3 | 1 | -0.6001E 04 | -0.4134E 07 | -0.2152E 07 | 0.1064E 07 | -86.99 | -17.98 | -0.9034 | 0.2936 | 0.0000 | 101 |
| 4 | 1 | -0.6088E 06 | -0.4039E 07 | -0.2056E 07 | 0.9145E 06 | 87.03  | -17.99 | -0.9509 | 0.5090 | 0.0000 | 12  |
| 4 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9480E 06 | 87.03  | -17.99 | -0.9272 | 0.5013 | 0.0000 | 68  |
| 4 | 1 | -0.6092E 04 | -0.4135E 07 | -0.2152E 07 | 0.1064E 07 | 87.02  | -17.99 | -0.9034 | 0.2936 | 0.0000 | 101 |
| 4 | 1 | -0.6090E 06 | -0.4039E 07 | -0.2056E 07 | 0.9153E 06 | -90.00 | -20.97 | -0.9335 | 0.5564 | 0.0000 | 13  |
| 4 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9478E 06 | -89.99 | -20.97 | -0.9101 | 0.5494 | 0.0000 | -4  |
| 4 | 1 | -0.6098E 04 | -0.4137E 07 | -0.2153E 07 | 0.1065E 07 | -90.00 | -20.97 | -0.8667 | 0.5405 | 0.0000 | 102 |
| 4 | 1 | -0.6096E 06 | -0.4034E 07 | -0.2052E 07 | 0.9121E 06 | -86.98 | -23.99 | -0.9135 | 0.4067 | 0.0000 | 14  |
| 4 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9475E 06 | -86.98 | -23.99 | -0.8706 | 0.5960 | 0.0000 | 69  |
| 4 | 1 | -0.6036E 04 | -0.4139E 07 | -0.2152E 07 | 0.1066E 07 | -86.98 | -23.98 | -0.8678 | 0.5864 | 0.0000 | 103 |
| 5 | 1 | -0.6092E 06 | -0.4033E 07 | -0.2052E 07 | 0.9119E 06 | 87.01  | -23.98 | -0.9135 | 0.4067 | 0.0000 | 14  |
| 5 | 1 | -0.1030E 06 | -0.4079E 07 | -0.2079E 07 | 0.9475E 06 | 87.01  | -23.98 | -0.8906 | 0.5960 | 0.0000 | 69  |
| 5 | 1 | -0.6092E 04 | -0.4135E 07 | -0.2152E 07 | 0.1066E 07 | 87.01  | -23.98 | -0.8678 | 0.5864 | 0.0000 | 103 |
| 5 | 1 | -0.6091E 06 | -0.4032E 07 | -0.2052E 07 | 0.9113E 06 | -90.00 | -26.98 | -0.8910 | 0.4540 | 0.0000 | 15  |
| 5 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9474E 06 | -90.00 | -26.98 | -0.8667 | 0.4426 | 0.0000 | -5  |
| 5 | 1 | -0.6093E 04 | -0.4135E 07 | -0.2152E 07 | 0.1066E 07 | -90.00 | -26.98 | -0.8664 | 0.4313 | 0.0000 | 104 |
| 5 | 1 | -0.6094E 06 | -0.4031E 07 | -0.2050E 07 | 0.9107E 06 | -86.99 | -29.98 | -0.8660 | 0.5000 | 0.0000 | 16  |
| 5 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9471E 06 | -86.99 | -29.98 | -0.8444 | 0.4875 | 0.0000 | 70  |
| 5 | 1 | -0.6092E 04 | -0.4139E 07 | -0.2152E 07 | 0.1066E 07 | -86.99 | -29.98 | -0.8227 | 0.4750 | 0.0000 | 105 |
| 6 | 1 | -0.6094E 06 | -0.4031E 07 | -0.2050E 07 | 0.9106E 06 | 87.00  | -29.98 | -0.8660 | 0.5000 | 0.0000 | 16  |
| 6 | 1 | -0.1030E 06 | -0.4079E 07 | -0.2079E 07 | 0.9471E 06 | 87.00  | -29.98 | -0.8444 | 0.4875 | 0.0000 | 70  |
| 6 | 1 | -0.6091E 04 | -0.4135E 07 | -0.2152E 07 | 0.1066E 07 | 87.00  | -29.98 | -0.8227 | 0.4750 | 0.0000 | 105 |
| 6 | 1 | -0.6092E 06 | -0.4031E 07 | -0.2050E 07 | 0.9108E 06 | -90.00 | -32.99 | -0.8367 | 0.5446 | 0.0000 | 17  |
| 6 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9470E 06 | -90.00 | -32.99 | -0.8177 | 0.5310 | 0.0000 | -6  |
| 6 | 1 | -0.6091E 04 | -0.4135E 07 | -0.2152E 07 | 0.1066E 07 | -90.00 | -32.99 | -0.7968 | 0.5174 | 0.0000 | 106 |
| 6 | 1 | -0.6093E 06 | -0.4030E 07 | -0.2029E 07 | 0.9103E 06 | -87.00 | -33.98 | -0.8091 | 0.5876 | 0.0000 | 18  |
| 6 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9467E 06 | -87.00 | -33.99 | -0.7888 | 0.5731 | 0.0000 | 71  |
| 6 | 1 | -0.6093E 04 | -0.4139E 07 | -0.2152E 07 | 0.1066E 07 | -87.00 | -33.99 | -0.7666 | 0.5564 | 0.0000 | 107 |
| 7 | 1 | -0.6093E 06 | -0.4031E 07 | -0.2050E 07 | 0.9106E 06 | 86.99  | -33.99 | -0.8091 | 0.5876 | 0.0000 | 18  |
| 7 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9468E 06 | 86.99  | -33.98 | -0.7888 | 0.5731 | 0.0000 | 71  |
| 7 | 1 | -0.6093E 04 | -0.4139E 07 | -0.2152E 07 | 0.1066E 07 | 86.99  | -33.99 | -0.7666 | 0.5564 | 0.0000 | 107 |
| 7 | 1 | -0.6091E 06 | -0.4030E 07 | -0.2050E 07 | 0.9110E 06 | 90.00  | -39.00 | -0.7772 | 0.6293 | 0.0000 | 19  |
| 7 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9468E 06 | 90.00  | -38.99 | -0.7574 | 0.6156 | 0.0000 | -7  |
| 7 | 1 | -0.6094E 04 | -0.4135E 07 | -0.2152E 07 | 0.1065E 07 | 90.00  | -38.99 | -0.7363 | 0.5976 | 0.0000 | 108 |
| 7 | 1 | -0.6093E 06 | -0.4031E 07 | -0.2050E 07 | 0.9110E 06 | -87.01 | -41.99 | -0.7432 | 0.6691 | 0.0000 | 20  |
| 7 | 1 | -0.1031E 06 | -0.4079E 07 | -0.2079E 07 | 0.9466E 06 | -87.00 | -41.99 | -0.7246 | 0.6524 | 0.0000 | 72  |
| 7 | 1 | -0.6094E 04 | -0.4139E 07 | -0.2152E 07 | 0.1065E 07 | -87.00 | -41.99 | -0.7060 | 0.6357 | 0.0000 | 109 |

|    |   |             |             |             |            |        |        |         |        |        |     |
|----|---|-------------|-------------|-------------|------------|--------|--------|---------|--------|--------|-----|
| 8  | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9112E 06 | 86.99  | -41.99 | -0.7432 | 0.6691 | 0.0000 | 20  |
| 8  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9066E 06 | 86.99  | -41.99 | -0.7246 | 0.6524 | 0.0000 | 12  |
| 8  | 1 | -0.6969E 04 | -0.2135E 07 | -0.2135E 07 | 0.1065E 07 | 86.99  | -41.99 | 0.7060  | 0.6337 | 0.0000 | 79  |
| 8  | 1 | -0.2091E 06 | -0.2032E 07 | -0.2032E 07 | 0.9116E 06 | 90.00  | -45.00 | -0.7072 | 0.7071 | 0.0000 | 21  |
| 8  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9066E 06 | 90.00  | -45.00 | -0.6895 | 0.6894 | 0.0000 | -8  |
| 8  | 1 | -0.7235E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -45.00 | 0.6718  | 0.6717 | 0.0000 | 110 |
| 8  | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9118E 06 | -87.01 | -48.00 | -0.6692 | 0.7431 | 0.0000 | 22  |
| 8  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9065E 06 | -87.01 | -48.00 | -0.6524 | 0.7246 | 0.0000 | 73  |
| 8  | 1 | -0.7040E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -46.00 | -0.6337 | 0.7060 | 0.0000 | 111 |
| 9  | 1 | -0.2094E 06 | -0.2032E 07 | -0.2032E 07 | 0.9118E 06 | 86.99  | -48.00 | -0.6692 | 0.7431 | 0.0000 | 22  |
| 9  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9066E 06 | 86.99  | -48.00 | -0.6524 | 0.7246 | 0.0000 | 73  |
| 9  | 1 | -0.6935E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -48.00 | -0.6337 | 0.7060 | 0.0000 | 111 |
| 9  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9121E 06 | 90.00  | -51.01 | -0.6294 | 0.7771 | 0.0000 | 23  |
| 9  | 1 | -0.7235E 04 | -0.2135E 07 | -0.2135E 07 | 0.9066E 06 | 90.00  | -51.00 | -0.6136 | 0.7577 | 0.0000 | -9  |
| 9  | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9123E 06 | 90.00  | -54.00 | -0.5979 | 0.7385 | 0.0000 | 112 |
| 9  | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9066E 06 | -87.01 | -54.00 | -0.5878 | 0.8090 | 0.0000 | 24  |
| 9  | 1 | -0.7035E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -54.00 | -0.5731 | 0.7888 | 0.0000 | 74  |
| 9  | 1 | -0.6935E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -54.00 | -0.5584 | 0.7686 | 0.0000 | 113 |
| 10 | 1 | -0.2094E 06 | -0.2032E 07 | -0.2032E 07 | 0.9123E 06 | 87.00  | -54.00 | -0.5878 | 0.8090 | 0.0000 | 24  |
| 10 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9066E 06 | 87.00  | -54.00 | -0.5731 | 0.7888 | 0.0000 | 74  |
| 10 | 1 | -0.6935E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -54.00 | -0.5584 | 0.7686 | 0.0000 | 113 |
| 10 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 90.00  | -57.01 | -0.5446 | 0.8387 | 0.0000 | 25  |
| 10 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9067E 06 | 90.00  | -57.01 | -0.5310 | 0.8177 | 0.0000 | -10 |
| 10 | 1 | -0.7190E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -57.01 | -0.5174 | 0.7967 | 0.0000 | 114 |
| 10 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | -87.00 | -60.00 | -0.5000 | 0.8660 | 0.0000 | 26  |
| 10 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | -87.00 | -60.00 | -0.4875 | 0.8444 | 0.0000 | 75  |
| 10 | 1 | -0.6935E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -60.00 | -0.4730 | 0.8227 | 0.0000 | 115 |
| 11 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 87.00  | -60.01 | -0.5000 | 0.8660 | 0.0000 | 26  |
| 11 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | 87.00  | -60.01 | -0.4875 | 0.8444 | 0.0000 | 75  |
| 11 | 1 | -0.6935E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -60.01 | -0.4730 | 0.8227 | 0.0000 | 115 |
| 11 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 90.00  | -63.00 | -0.4540 | 0.8910 | 0.0000 | 27  |
| 11 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | 90.00  | -63.00 | -0.4426 | 0.8687 | 0.0000 | -11 |
| 11 | 1 | -0.7187E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -63.00 | -0.4313 | 0.8463 | 0.0000 | 116 |
| 11 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | -87.00 | -66.00 | -0.4087 | 0.9135 | 0.0000 | 28  |
| 11 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9070E 06 | -87.00 | -66.00 | -0.3966 | 0.8907 | 0.0000 | 76  |
| 11 | 1 | -0.6929E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -66.00 | -0.3864 | 0.8679 | 0.0000 | 117 |
| 12 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 87.00  | -66.01 | -0.4087 | 0.9135 | 0.0000 | 28  |
| 12 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9070E 06 | 87.00  | -66.01 | -0.3966 | 0.8907 | 0.0000 | 76  |
| 12 | 1 | -0.6969E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -66.01 | -0.3864 | 0.8679 | 0.0000 | 117 |
| 12 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 90.00  | -69.00 | -0.3583 | 0.9356 | 0.0000 | 29  |
| 12 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | 90.00  | -69.00 | -0.3494 | 0.9102 | 0.0000 | -12 |
| 12 | 1 | -0.7203E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -69.00 | -0.3406 | 0.8869 | 0.0000 | 118 |
| 12 | 1 | -0.2094E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | -87.00 | -72.00 | -0.3090 | 0.9511 | 0.0000 | 30  |
| 12 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | -87.00 | -72.00 | -0.3013 | 0.9273 | 0.0000 | 77  |
| 12 | 1 | -0.6921E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -72.00 | -0.2935 | 0.9035 | 0.0000 | 119 |
| 13 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 87.00  | -72.00 | -0.3090 | 0.9511 | 0.0000 | 30  |
| 13 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9069E 06 | 87.00  | -72.00 | -0.3013 | 0.9273 | 0.0000 | 77  |
| 13 | 1 | -0.6928E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -72.00 | -0.2935 | 0.9035 | 0.0000 | 119 |
| 13 | 1 | -0.2095E 06 | -0.2032E 07 | -0.2032E 07 | 0.9125E 06 | 90.00  | -75.00 | -0.2586 | 0.9639 | 0.0000 | 31  |
| 13 | 1 | -0.1031E 06 | -0.2076E 07 | -0.2076E 07 | 0.9068E 06 | -90.00 | -75.00 | -0.2528 | 0.9418 | 0.0000 | -13 |

|    |   |             |             |             |            |        |        |         |        |        |     |
|----|---|-------------|-------------|-------------|------------|--------|--------|---------|--------|--------|-----|
| 13 | 1 | -0.727E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -75.00 | -0.2459 | 0.9176 | 0.0000 | 120 |
| 13 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | -87.00 | -78.00 | -0.2079 | 0.9781 | 0.0000 | 52  |
| 13 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9067E 06 | -87.00 | -78.00 | -0.2027 | 0.9557 | 0.0000 | 78  |
| 13 | 1 | -0.6928E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -78.00 | -0.1975 | 0.9292 | 0.0000 | 121 |
| 14 | 1 | -0.2093E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | 87.00  | -78.00 | -0.2079 | 0.9781 | 0.0000 | 52  |
| 14 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9067E 06 | 87.00  | -78.00 | -0.2027 | 0.9557 | 0.0000 | 78  |
| 14 | 1 | -0.6979E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -78.00 | -0.1975 | 0.9292 | 0.0000 | 121 |
| 14 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | 90.00  | -81.00 | -0.1564 | 0.9877 | 0.0000 | 53  |
| 14 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 90.00  | -81.00 | -0.1525 | 0.9650 | 0.0000 | 121 |
| 14 | 1 | -0.649E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -81.00 | -0.1466 | 0.9383 | 0.0000 | 142 |
| 14 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | -87.00 | -84.00 | -0.1045 | 0.9945 | 0.0000 | 54  |
| 14 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | -87.00 | -84.00 | -0.1019 | 0.9697 | 0.0000 | 79  |
| 14 | 1 | -0.6945E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -84.00 | -0.0993 | 0.9448 | 0.0000 | 123 |
| 15 | 1 | -0.2093E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | 87.00  | -84.00 | -0.1045 | 0.9945 | 0.0000 | 54  |
| 15 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 87.00  | -84.00 | -0.1019 | 0.9697 | 0.0000 | 79  |
| 15 | 1 | -0.6973E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | -84.00 | -0.0993 | 0.9448 | 0.0000 | 123 |
| 15 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | 90.00  | -87.00 | -0.0523 | 0.9986 | 0.0000 | 55  |
| 15 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 90.00  | -87.00 | -0.0510 | 0.9757 | 0.0000 | 115 |
| 15 | 1 | -0.662E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | -87.00 | -0.0497 | 0.9487 | 0.0000 | 124 |
| 15 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9117E 06 | -87.00 | -90.00 | -0.0000 | 1.0000 | 0.0000 | 4   |
| 15 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | -87.00 | -90.00 | -0.0000 | 0.9750 | 0.0000 | 80  |
| 15 | 1 | -0.6959E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | -90.00 | -0.0000 | 0.9500 | 0.0000 | 3   |
| 16 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9117E 06 | 87.00  | 90.00  | -0.0000 | 1.0000 | 0.0000 | 4   |
| 16 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 87.00  | -90.00 | 0.0000  | 0.9750 | 0.0000 | 80  |
| 16 | 1 | -0.6959E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 90.00  | -0.0000 | 0.9500 | 0.0000 | 3   |
| 16 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | 90.00  | 87.00  | 0.0523  | 0.9986 | 0.0000 | 56  |
| 16 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 90.00  | 87.00  | 0.0510  | 0.9757 | 0.0000 | 116 |
| 16 | 1 | -0.662E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 87.00  | 0.0497  | 0.9487 | 0.0000 | 125 |
| 16 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | -87.00 | 84.00  | 0.1045  | 0.9945 | 0.0000 | 57  |
| 16 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | -87.00 | 84.00  | 0.1019  | 0.9697 | 0.0000 | 81  |
| 16 | 1 | -0.6973E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 84.00  | 0.0993  | 0.9448 | 0.0000 | 126 |
| 17 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9118E 06 | 87.00  | 84.00  | 0.1045  | 0.9945 | 0.0000 | 57  |
| 17 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 87.00  | 84.00  | 0.1019  | 0.9697 | 0.0000 | 81  |
| 17 | 1 | -0.6945E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 84.00  | 0.0993  | 0.9448 | 0.0000 | 126 |
| 17 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | 90.00  | 81.00  | 0.1564  | 0.9877 | 0.0000 | 58  |
| 17 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9066E 06 | 90.00  | 81.00  | 0.1525  | 0.9650 | 0.0000 | 117 |
| 17 | 1 | -0.669E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 81.00  | 0.1466  | 0.9383 | 0.0000 | 127 |
| 17 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | -87.00 | 78.00  | 0.2079  | 0.9781 | 0.0000 | 59  |
| 17 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9067E 06 | -87.00 | 78.00  | 0.2027  | 0.9557 | 0.0000 | 82  |
| 17 | 1 | -0.6979E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 78.00  | 0.1975  | 0.9292 | 0.0000 | 128 |
| 18 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9120E 06 | 87.00  | 78.00  | 0.2079  | 0.9781 | 0.0000 | 59  |
| 18 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9067E 06 | 87.00  | 78.00  | 0.2027  | 0.9557 | 0.0000 | 82  |
| 18 | 1 | -0.6945E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 78.00  | 0.1975  | 0.9292 | 0.0000 | 128 |
| 18 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2035E 07 | 0.9122E 06 | 90.00  | 75.00  | 0.2508  | 0.9659 | 0.0000 | 40  |
| 18 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9068E 06 | 90.00  | 75.00  | 0.2523  | 0.9418 | 0.0000 | 118 |
| 18 | 1 | -0.667E 04  | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 75.00  | 0.2459  | 0.9176 | 0.0000 | 129 |
| 18 | 1 | -0.2093E 06 | -0.2035E 07 | -0.2035E 07 | 0.9125E 06 | -87.00 | 72.00  | 0.3090  | 0.9511 | 0.0000 | 41  |
| 18 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2070E 07 | 0.9069E 06 | -87.00 | 72.00  | 0.3013  | 0.9273 | 0.0000 | 83  |
| 18 | 1 | -0.6978E 04 | -0.2135E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 72.00  | 0.2955  | 0.9055 | 0.0000 | 130 |
| 19 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2035E 07 | 0.9125E 06 | 87.00  | 72.00  | 0.3090  | 0.9511 | 0.0000 | 41  |

|    |   |             |             |             |            |        |       |        |        |        |     |
|----|---|-------------|-------------|-------------|------------|--------|-------|--------|--------|--------|-----|
| 19 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.00  | 72.00 | 0.3013 | 0.9273 | 0.0000 | 83  |
| 19 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 72.00 | 0.2935 | 0.9035 | 0.0000 | 130 |
| 19 | 1 | -0.2090E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 69.00 | 0.3583 | 0.9356 | 0.0000 | 42  |
| 19 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 69.00 | 0.3494 | 0.9102 | 0.0000 | 19  |
| 19 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 69.00 | 0.3404 | 0.8869 | 0.0000 | 131 |
| 19 | 1 | -0.2090E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -87.00 | 66.01 | 0.4067 | 0.9135 | 0.0000 | 43  |
| 19 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | -87.00 | 66.01 | 0.3966 | 0.9907 | 0.0000 | 84  |
| 19 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 66.01 | 0.3864 | 0.8679 | 0.0000 | 132 |
| 20 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 87.00  | 66.00 | 0.4067 | 0.9135 | 0.0000 | 43  |
| 20 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.00  | 66.00 | 0.3966 | 0.8907 | 0.0000 | 84  |
| 20 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 66.00 | 0.3864 | 0.8679 | 0.0000 | 132 |
| 20 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 65.00 | 0.4540 | 0.8910 | 0.0000 | 44  |
| 20 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 65.00 | 0.4426 | 0.8687 | 0.0000 | 40  |
| 20 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 65.00 | 0.4313 | 0.8465 | 0.0000 | 133 |
| 20 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -87.00 | 60.01 | 0.5000 | 0.8660 | 0.0000 | 45  |
| 20 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | -87.00 | 60.01 | 0.4875 | 0.8444 | 0.0000 | 85  |
| 20 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 60.01 | 0.4750 | 0.8227 | 0.0000 | 134 |
| 21 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 87.00  | 60.00 | 0.5000 | 0.8650 | 0.0000 | 45  |
| 21 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.00  | 60.00 | 0.4875 | 0.8444 | 0.0000 | 85  |
| 21 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 60.00 | 0.4750 | 0.8227 | 0.0000 | 134 |
| 21 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 57.01 | 0.5446 | 0.8367 | 0.0000 | 46  |
| 21 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 57.01 | 0.5310 | 0.8177 | 0.0000 | 41  |
| 21 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 57.01 | 0.5174 | 0.7967 | 0.0000 | 135 |
| 21 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -87.00 | 54.00 | 0.5878 | 0.8090 | 0.0000 | 47  |
| 21 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | -87.00 | 54.00 | 0.5731 | 0.7868 | 0.0000 | 86  |
| 21 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | -87.00 | 54.00 | 0.5584 | 0.7666 | 0.0000 | 136 |
| 22 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 87.01  | 54.00 | 0.5878 | 0.8090 | 0.0000 | 47  |
| 22 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.00  | 54.00 | 0.5731 | 0.7868 | 0.0000 | 86  |
| 22 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 54.00 | 0.5584 | 0.7666 | 0.0000 | 136 |
| 22 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 51.01 | 0.6294 | 0.7771 | 0.0000 | 48  |
| 22 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 51.00 | 0.6136 | 0.7577 | 0.0000 | 42  |
| 22 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 51.00 | 0.5979 | 0.7363 | 0.0000 | 137 |
| 22 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -86.99 | 48.00 | 0.6692 | 0.7431 | 0.0000 | 49  |
| 22 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | -86.99 | 48.00 | 0.6524 | 0.7240 | 0.0000 | 87  |
| 22 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | -86.99 | 48.00 | 0.6357 | 0.7000 | 0.0000 | 138 |
| 23 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 87.01  | 48.00 | 0.6692 | 0.7431 | 0.0000 | 49  |
| 23 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.01  | 48.00 | 0.6524 | 0.7240 | 0.0000 | 87  |
| 23 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 48.00 | 0.6357 | 0.7000 | 0.0000 | 138 |
| 23 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 45.00 | 0.7072 | 0.7071 | 0.0000 | 50  |
| 23 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 45.00 | 0.6895 | 0.6844 | 0.0000 | 43  |
| 23 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 45.00 | 0.6716 | 0.6717 | 0.0000 | 139 |
| 23 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -86.99 | 41.99 | 0.7432 | 0.6691 | 0.0000 | 51  |
| 23 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | -86.99 | 41.99 | 0.7240 | 0.6524 | 0.0000 | 88  |
| 23 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | -86.99 | 41.99 | 0.7000 | 0.6357 | 0.0000 | 140 |
| 24 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 87.01  | 41.99 | 0.7432 | 0.6691 | 0.0000 | 51  |
| 24 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 87.00  | 41.99 | 0.7240 | 0.6524 | 0.0000 | 88  |
| 24 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 87.00  | 41.99 | 0.7000 | 0.6357 | 0.0000 | 140 |
| 24 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | 90.00  | 39.00 | 0.7702 | 0.6293 | 0.0000 | 52  |
| 24 | 1 | -0.1031E 06 | -0.2070E 07 | -0.2077E 07 | 0.9869E 06 | 90.00  | 38.99 | 0.7578 | 0.6136 | 0.0000 | 44  |
| 24 | 1 | -0.6921E 04 | -0.2134E 07 | -0.2135E 07 | 0.1064E 07 | 90.00  | 38.99 | 0.7363 | 0.5978 | 0.0000 | 141 |
| 24 | 1 | -0.2093E 06 | -0.2034E 07 | -0.2034E 07 | 0.9125E 06 | -86.99 | 35.99 | 0.8091 | 0.5878 | 0.0000 | 53  |

|    |   |             |             |             |            |         |       |        |        |        |     |
|----|---|-------------|-------------|-------------|------------|---------|-------|--------|--------|--------|-----|
| 24 | 1 | -0.1031E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | -0.6699 | 35.99 | 0.7888 | 0.5751 | 0.0000 | 89  |
| 24 | 1 | -0.6693E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -0.6699 | 35.99 | 0.7686 | 0.5564 | 0.0000 | 142 |
| 25 | 1 | -0.2093E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | 07.00   | 35.99 | 0.6091 | 0.5678 | 0.0000 | 53  |
| 25 | 1 | -0.1031E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | 07.00   | 35.99 | 0.7888 | 0.5751 | 0.0000 | 89  |
| 25 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 07.00   | 35.99 | 0.7686 | 0.5564 | 0.0000 | 142 |
| 25 | 1 | -0.2092E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | 40.00   | 32.99 | 0.8387 | 0.5460 | 0.0000 | 54  |
| 25 | 1 | -0.1031E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | 40.00   | 32.99 | 0.8177 | 0.5310 | 0.0000 | -25 |
| 25 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 40.00   | 32.99 | 0.7968 | 0.5174 | 0.0000 | 143 |
| 25 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | -07.00  | 29.99 | 0.8660 | 0.5000 | 0.0000 | 55  |
| 25 | 1 | -0.1030E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | -07.00  | 29.99 | 0.8444 | 0.4875 | 0.0000 | 90  |
| 25 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -07.00  | 29.99 | 0.8227 | 0.4750 | 0.0000 | 144 |
| 26 | 1 | -0.2094E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | 06.99   | 29.99 | 0.8660 | 0.5000 | 0.0000 | 55  |
| 26 | 1 | -0.1031E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | 06.99   | 29.99 | 0.8444 | 0.4875 | 0.0000 | 90  |
| 26 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 06.99   | 29.99 | 0.8227 | 0.4750 | 0.0000 | 144 |
| 26 | 1 | -0.2091E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | 40.00   | 26.99 | 0.8910 | 0.4540 | 0.0000 | 56  |
| 26 | 1 | -0.1031E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | 40.00   | 26.99 | 0.8687 | 0.4420 | 0.0000 | -26 |
| 26 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 40.00   | 26.99 | 0.8460 | 0.4315 | 0.0000 | 145 |
| 26 | 1 | -0.2092E 06 | -0.2035E 07 | -0.2045E 07 | 0.9105E 06 | -07.01  | 25.99 | 0.9155 | 0.4067 | 0.0000 | 57  |
| 26 | 1 | -0.1030E 06 | -0.2077E 07 | -0.2075E 07 | 0.9688E 06 | -07.01  | 25.99 | 0.8900 | 0.3960 | 0.0000 | 91  |
| 26 | 1 | -0.7037E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -07.01  | 25.99 | 0.8678 | 0.3864 | 0.0000 | 146 |
| 27 | 1 | -0.2096E 06 | -0.2034E 07 | -0.2035E 07 | 0.9121E 06 | 06.98   | 25.99 | 0.9155 | 0.4067 | 0.0000 | 57  |
| 27 | 1 | -0.1031E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | 06.98   | 25.99 | 0.8900 | 0.3960 | 0.0000 | 91  |
| 27 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 06.98   | 25.99 | 0.8678 | 0.3864 | 0.0000 | 146 |
| 27 | 1 | -0.2090E 06 | -0.2035E 07 | -0.2035E 07 | 0.9135E 06 | 40.00   | 20.97 | 0.9555 | 0.3594 | 0.0000 | 58  |
| 27 | 1 | -0.1031E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | 40.00   | 20.97 | 0.9101 | 0.3494 | 0.0000 | -27 |
| 27 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 40.00   | 20.97 | 0.8868 | 0.3405 | 0.0000 | 147 |
| 27 | 1 | -0.2098E 06 | -0.2035E 07 | -0.2035E 07 | 0.9145E 06 | -07.03  | 17.99 | 0.9509 | 0.3090 | 0.0000 | 59  |
| 27 | 1 | -0.1031E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | -07.03  | 17.99 | 0.9272 | 0.3015 | 0.0000 | 92  |
| 27 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -07.03  | 17.99 | 0.9054 | 0.2956 | 0.0000 | 148 |
| 28 | 1 | -0.2096E 06 | -0.2035E 07 | -0.2035E 07 | 0.9149E 06 | 06.98   | 17.99 | 0.9509 | 0.3090 | 0.0000 | 59  |
| 28 | 1 | -0.1032E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | 06.98   | 17.99 | 0.9272 | 0.3015 | 0.0000 | 92  |
| 28 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 06.98   | 17.99 | 0.9054 | 0.2956 | 0.0000 | 148 |
| 28 | 1 | -0.2090E 06 | -0.2035E 07 | -0.2035E 07 | 0.9159E 06 | 40.00   | 14.97 | 0.9658 | 0.2568 | 0.0000 | 60  |
| 28 | 1 | -0.1030E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | 40.00   | 14.97 | 0.9416 | 0.2524 | 0.0000 | -28 |
| 28 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 40.00   | 14.97 | 0.9175 | 0.2459 | 0.0000 | 149 |
| 28 | 1 | -0.2096E 06 | -0.2035E 07 | -0.2040E 07 | 0.9172E 06 | -07.03  | 12.00 | 0.9780 | 0.2079 | 0.0000 | 61  |
| 28 | 1 | -0.1032E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | -07.03  | 12.00 | 0.9555 | 0.2027 | 0.0000 | 93  |
| 28 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -07.03  | 12.00 | 0.9291 | 0.1975 | 0.0000 | 150 |
| 29 | 1 | -0.2093E 06 | -0.2044E 07 | -0.2040E 07 | 0.9175E 06 | 07.02   | 11.98 | 0.9780 | 0.2079 | 0.0000 | 61  |
| 29 | 1 | -0.1035E 06 | -0.2080E 07 | -0.2080E 07 | 0.9688E 06 | 07.03   | 11.98 | 0.9555 | 0.2027 | 0.0000 | 93  |
| 29 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | 07.03   | 11.98 | 0.9291 | 0.1975 | 0.0000 | 150 |
| 29 | 1 | -0.2091E 06 | -0.2042E 07 | -0.2040E 07 | 0.9165E 06 | -06.99  | 9.00  | 0.9675 | 0.1565 | 0.0000 | 62  |
| 29 | 1 | -0.1030E 06 | -0.2075E 07 | -0.2080E 07 | 0.9688E 06 | -06.99  | 8.99  | 0.9420 | 0.1520 | 0.0000 | -29 |
| 29 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2135E 07 | 0.1066E 07 | -06.99  | 8.99  | 0.9181 | 0.1480 | 0.0000 | 151 |
| 29 | 1 | -0.2091E 06 | -0.2041E 07 | -0.2045E 07 | 0.9160E 06 | -06.98  | 5.99  | 0.9744 | 0.1060 | 0.0000 | 63  |
| 29 | 1 | -0.1034E 06 | -0.2080E 07 | -0.2080E 07 | 0.9688E 06 | -06.98  | 5.99  | 0.9675 | 0.1019 | 0.0000 | 94  |
| 29 | 1 | -0.7036E 04 | -0.2135E 07 | -0.2140E 07 | 0.1066E 07 | -06.99  | 6.00  | 0.9446 | 0.0995 | 0.0000 | 152 |
| 30 | 1 | -0.2098E 06 | -0.2040E 07 | -0.2034E 07 | 0.9158E 06 | 07.13   | 5.96  | 0.9944 | 0.1060 | 0.0000 | 63  |
| 30 | 1 | -0.1030E 06 | -0.2075E 07 | -0.2075E 07 | 0.9688E 06 | 07.14   | 5.95  | 0.9675 | 0.1019 | 0.0000 | 94  |

|    |   |             |             |             |            |        |       |        |         |        |     |
|----|---|-------------|-------------|-------------|------------|--------|-------|--------|---------|--------|-----|
| 30 | 1 | -0.7439E 04 | -0.2135E 07 | -0.2140E 07 | 0.1066E 07 | 87.12  | 5.97  | 0.9446 | 0.0903  | 0.0000 | 132 |
| 30 | 1 | -0.2095E 06 | -0.2020E 07 | -0.2025E 07 | 0.4095E 06 | -89.95 | 3.04  | 0.9965 | 0.0524  | 0.0000 | 64  |
| 30 | 1 | -0.1033E 06 | -0.2070E 07 | -0.2075E 07 | 0.4078E 06 | -89.94 | 3.01  | 0.9736 | 0.0510  | 0.0000 | -30 |
| 30 | 1 | -0.7658E 04 | -0.2142E 07 | -0.2147E 07 | 0.1072E 07 | -89.94 | 5.03  | 0.9406 | 0.0497  | 0.0000 | 133 |
| 30 | 1 | 0.6257E 06  | -0.1081E 07 | -0.1117E 06 | 0.4042E 06 | -86.18 | -0.13 | 1.0000 | -0.0000 | 0.0000 | 6   |
| 30 | 1 | 0.5087E 06  | -0.1080E 07 | -0.1085E 07 | 0.4060E 06 | -86.18 | -0.13 | 0.9750 | -0.0000 | 0.0000 | 95  |
| 30 | 1 | 0.1046E 07  | -0.1103E 07 | -0.1108E 07 | 0.1075E 07 | -86.92 | -0.09 | 0.9500 | -0.0000 | 0.0000 | 3   |

## AVERAGING ROUTINE ENTERED

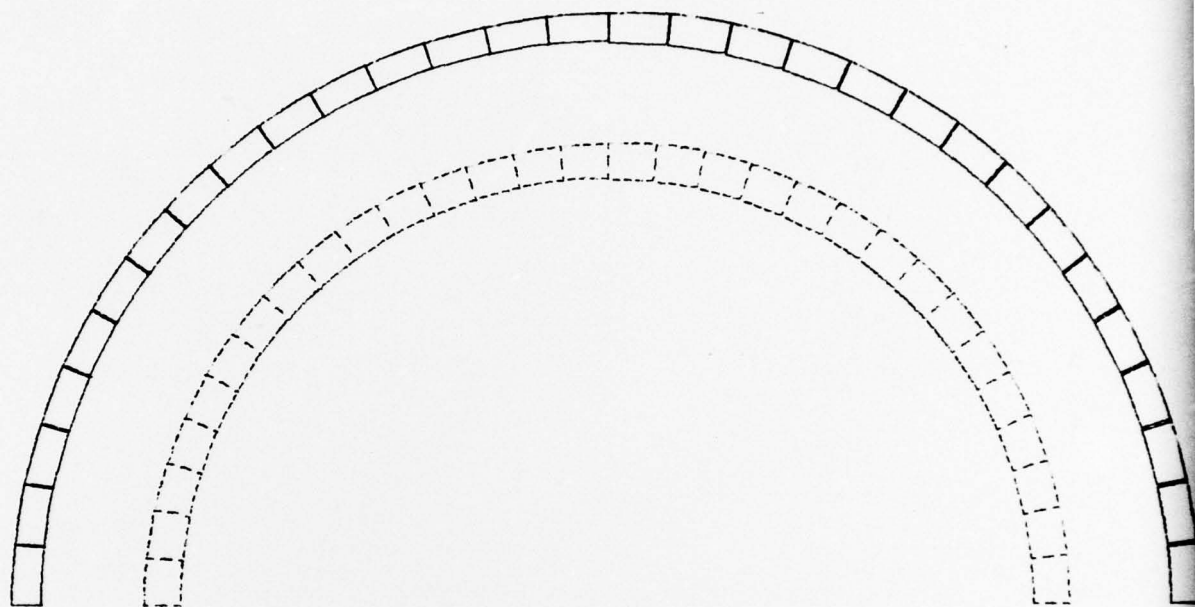
| NODE NO | LOAD CASE | GLOBAL X | GLOBAL Y | GLOBAL Z | ANGLE  | BETA   | SIGMA 1    | SIGMA 2    | SIGMA 3    | SIGMA 1 2 | TAU MAX   | ELE. NO |
|---------|-----------|----------|----------|----------|--------|--------|------------|------------|------------|-----------|-----------|---------|
| 1       | 1         | -0.9500  | 0.0000   | 0.0000   | 0.0000 | 0.1    | 0.105E 07  | -0.110E 07 | 0.000E 00  | 0.107E 07 | 0.107E 07 | 0       |
| 2       | 1         | -1.0000  | 0.0000   | 0.0000   | 0.0000 | 0.1    | 0.126E 06  | -0.108E 07 | 0.000E 00  | 0.903E 06 | 0.903E 06 | 0       |
| 3       | 1         | 0.0000   | 0.9500   | 0.0000   | 0.0000 | 90.0   | -0.696E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0       |
| 4       | 1         | 0.0000   | 1.0000   | 0.0000   | 0.0000 | 90.0   | -0.409E 06 | -0.205E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 5       | 1         | 0.9500   | 0.0000   | 0.0000   | 0.0000 | -0.1   | 0.105E 07  | -0.110E 07 | 0.000E 00  | 0.107E 07 | 0.107E 07 | 0       |
| 6       | 1         | 1.0000   | 0.0000   | 0.0000   | 0.0000 | -0.1   | 0.126E 06  | -0.108E 07 | 0.000E 00  | 0.903E 06 | 0.903E 06 | 0       |
| 7       | 1         | -0.9965  | 0.0524   | 0.0000   | 0.0000 | -3.0   | -0.409E 06 | -0.205E 07 | -0.205E 07 | 0.909E 06 | 0.909E 06 | 0       |
| 8       | 1         | -0.9944  | 0.1046   | 0.0000   | 0.0000 | -6.0   | -0.409E 06 | -0.204E 07 | -0.205E 07 | 0.916E 06 | 0.916E 06 | 0       |
| 9       | 1         | -0.9875  | 0.1265   | 0.0000   | 0.0000 | -9.0   | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.917E 06 | 0.917E 06 | 0       |
| 10      | 1         | -0.9780  | 0.2079   | 0.0000   | 0.0000 | -12.0  | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.917E 06 | 0.917E 06 | 0       |
| 11      | 1         | -0.9650  | 0.2388   | 0.0000   | 0.0000 | -15.0  | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.916E 06 | 0.916E 06 | 0       |
| 12      | 1         | -0.9509  | 0.3090   | 0.0000   | 0.0000 | -18.0  | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.915E 06 | 0.915E 06 | 0       |
| 13      | 1         | -0.9353  | 0.3584   | 0.0000   | 0.0000 | -21.0  | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.913E 06 | 0.913E 06 | 0       |
| 14      | 1         | -0.9152  | 0.4067   | 0.0000   | 0.0000 | -24.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 15      | 1         | -0.8910  | 0.4540   | 0.0000   | 0.0000 | -27.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 16      | 1         | -0.8600  | 0.5000   | 0.0000   | 0.0000 | -30.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 17      | 1         | -0.8367  | 0.5446   | 0.0000   | 0.0000 | -33.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 18      | 1         | -0.8071  | 0.5878   | 0.0000   | 0.0000 | -36.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 19      | 1         | -0.7772  | 0.6293   | 0.0000   | 0.0000 | -39.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 20      | 1         | -0.7452  | 0.6691   | 0.0000   | 0.0000 | -42.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.911E 06 | 0.911E 06 | 0       |
| 21      | 1         | -0.7072  | 0.7071   | 0.0000   | 0.0000 | -45.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 22      | 1         | -0.6692  | 0.7431   | 0.0000   | 0.0000 | -48.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 23      | 1         | -0.6294  | 0.7771   | 0.0000   | 0.0000 | -51.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 24      | 1         | -0.5870  | 0.8090   | 0.0000   | 0.0000 | -54.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 25      | 1         | -0.5446  | 0.8387   | 0.0000   | 0.0000 | -57.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 26      | 1         | -0.5000  | 0.8660   | 0.0000   | 0.0000 | -60.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.913E 06 | 0.913E 06 | 0       |
| 27      | 1         | -0.4540  | 0.8910   | 0.0000   | 0.0000 | -63.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.913E 06 | 0.913E 06 | 0       |
| 28      | 1         | -0.4067  | 0.9135   | 0.0000   | 0.0000 | -66.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 29      | 1         | -0.3585  | 0.9336   | 0.0000   | 0.0000 | -69.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 30      | 1         | -0.3090  | 0.9511   | 0.0000   | 0.0000 | -72.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 31      | 1         | -0.2580  | 0.9659   | 0.0000   | 0.0000 | -75.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 32      | 1         | -0.2079  | 0.9781   | 0.0000   | 0.0000 | -78.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 33      | 1         | -0.1564  | 0.9877   | 0.0000   | 0.0000 | -81.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 34      | 1         | -0.1043  | 0.9945   | 0.0000   | 0.0000 | -84.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 35      | 1         | -0.0523  | 0.9986   | 0.0000   | 0.0000 | -87.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 36      | 1         | 0.0023   | 0.9986   | 0.0000   | 0.0000 | -89.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 37      | 1         | 0.0543   | 0.9945   | 0.0000   | 0.0000 | -90.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 38      | 1         | 0.1064   | 0.9877   | 0.0000   | 0.0000 | -91.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 39      | 1         | 0.2079   | 0.9781   | 0.0000   | 0.0000 | -92.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 40      | 1         | 0.2580   | 0.9659   | 0.0000   | 0.0000 | -93.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 41      | 1         | 0.3090   | 0.9511   | 0.0000   | 0.0000 | -94.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 42      | 1         | 0.3585   | 0.9336   | 0.0000   | 0.0000 | -95.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 43      | 1         | 0.4067   | 0.9135   | 0.0000   | 0.0000 | -96.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 44      | 1         | 0.4540   | 0.8910   | 0.0000   | 0.0000 | -97.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.913E 06 | 0.913E 06 | 0       |
| 45      | 1         | 0.5000   | 0.8660   | 0.0000   | 0.0000 | -98.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.913E 06 | 0.913E 06 | 0       |
| 46      | 1         | 0.5446   | 0.8387   | 0.0000   | 0.0000 | -99.0  | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 47      | 1         | 0.5870   | 0.8090   | 0.0000   | 0.0000 | -100.0 | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 48      | 1         | 0.6294   | 0.7771   | 0.0000   | 0.0000 | -101.0 | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |
| 49      | 1         | 0.6692   | 0.7431   | 0.0000   | 0.0000 | -102.0 | -0.409E 06 | -0.203E 07 | -0.205E 07 | 0.912E 06 | 0.912E 06 | 0       |

|     |   |         |         |        |        |            |            |            |           |           |           |
|-----|---|---------|---------|--------|--------|------------|------------|------------|-----------|-----------|-----------|
| 50  | 1 | 0.7074  | 0.6071  | 0.0000 | 45.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.912E 06 | 0.912E 06 | 0.912E 06 |
| 51  | 1 | 0.7452  | 0.6091  | 0.0000 | 42.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 52  | 1 | 0.7774  | 0.6293  | 0.0000 | 39.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 53  | 1 | 0.8091  | 0.6078  | 0.0000 | 36.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 54  | 1 | 0.8307  | 0.5446  | 0.0000 | 33.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 55  | 1 | 0.8600  | 0.5000  | 0.0000 | 30.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 56  | 1 | 0.8910  | 0.5240  | 0.0000 | 27.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.911E 06 | 0.911E 06 | 0.911E 06 |
| 57  | 1 | 0.9155  | 0.5067  | 0.0000 | 24.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.912E 06 | 0.912E 06 | 0.912E 06 |
| 58  | 1 | 0.9355  | 0.5284  | 0.0000 | 21.0   | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.913E 06 | 0.913E 06 | 0.913E 06 |
| 59  | 1 | 0.9500  | 0.5000  | 0.0000 | 18.0   | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.915E 06 | 0.915E 06 | 0.915E 06 |
| 60  | 1 | 0.9620  | 0.5288  | 0.0000 | 15.0   | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.916E 06 | 0.916E 06 | 0.916E 06 |
| 61  | 1 | 0.9750  | 0.5079  | 0.0000 | 12.0   | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.917E 06 | 0.917E 06 | 0.917E 06 |
| 62  | 1 | 0.9875  | 0.5205  | 0.0000 | 9.0    | -0.409E 06 | -0.204E 07 | -0.204E 07 | 0.917E 06 | 0.917E 06 | 0.917E 06 |
| 63  | 1 | 0.9944  | 0.5066  | 0.0000 | 6.0    | -0.409E 06 | -0.204E 07 | -0.203E 07 | 0.916E 06 | 0.916E 06 | 0.916E 06 |
| 64  | 1 | 0.9985  | 0.5224  | 0.0000 | 3.0    | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.909E 06 | 0.909E 06 | 0.909E 06 |
| 65  | 1 | -0.9750 | -0.5000 | 0.0000 | 0.1    | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.908E 06 | 0.908E 06 | 0.908E 06 |
| 66  | 1 | -0.9620 | 0.5079  | 0.0000 | -6.0   | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.908E 06 | 0.908E 06 | 0.908E 06 |
| 67  | 1 | -0.9555 | 0.5227  | 0.0000 | -12.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.908E 06 | 0.908E 06 | 0.908E 06 |
| 68  | 1 | -0.9472 | 0.5075  | 0.0000 | -18.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.908E 06 | 0.908E 06 | 0.908E 06 |
| 69  | 1 | -0.9300 | 0.5066  | 0.0000 | -24.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.908E 06 | 0.908E 06 | 0.908E 06 |
| 70  | 1 | -0.9155 | 0.5240  | 0.0000 | -30.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 71  | 1 | -0.9000 | 0.5067  | 0.0000 | -36.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 72  | 1 | -0.8875 | 0.5224  | 0.0000 | -42.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 73  | 1 | -0.8750 | 0.5079  | 0.0000 | -48.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 74  | 1 | -0.8624 | 0.5288  | 0.0000 | -54.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 75  | 1 | -0.8500 | 0.5066  | 0.0000 | -60.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 76  | 1 | -0.8375 | 0.5227  | 0.0000 | -66.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 77  | 1 | -0.8250 | 0.5075  | 0.0000 | -72.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 78  | 1 | -0.8125 | 0.5240  | 0.0000 | -78.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 79  | 1 | -0.8000 | 0.5067  | 0.0000 | -84.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 80  | 1 | -0.7875 | 0.5224  | 0.0000 | -90.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 81  | 1 | -0.7750 | 0.5079  | 0.0000 | -96.0  | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 82  | 1 | -0.7624 | 0.5288  | 0.0000 | -102.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 83  | 1 | -0.7500 | 0.5066  | 0.0000 | -108.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 84  | 1 | -0.7375 | 0.5227  | 0.0000 | -114.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 85  | 1 | -0.7250 | 0.5075  | 0.0000 | -120.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 86  | 1 | -0.7125 | 0.5240  | 0.0000 | -126.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 87  | 1 | -0.7000 | 0.5067  | 0.0000 | -132.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 88  | 1 | -0.6875 | 0.5224  | 0.0000 | -138.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 89  | 1 | -0.6750 | 0.5079  | 0.0000 | -144.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 90  | 1 | -0.6624 | 0.5288  | 0.0000 | -150.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 91  | 1 | -0.6500 | 0.5066  | 0.0000 | -156.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 92  | 1 | -0.6375 | 0.5227  | 0.0000 | -162.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 93  | 1 | -0.6250 | 0.5075  | 0.0000 | -168.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 94  | 1 | -0.6125 | 0.5240  | 0.0000 | -174.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 95  | 1 | -0.6000 | 0.5067  | 0.0000 | -180.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 96  | 1 | -0.5875 | 0.5224  | 0.0000 | -186.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 97  | 1 | -0.5750 | 0.5079  | 0.0000 | -192.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 98  | 1 | -0.5624 | 0.5288  | 0.0000 | -198.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 99  | 1 | -0.5500 | 0.5066  | 0.0000 | -204.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 100 | 1 | -0.5375 | 0.5227  | 0.0000 | -210.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 101 | 1 | -0.5250 | 0.5075  | 0.0000 | -216.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 102 | 1 | -0.5125 | 0.5240  | 0.0000 | -222.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 103 | 1 | -0.5000 | 0.5067  | 0.0000 | -228.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 104 | 1 | -0.4875 | 0.5224  | 0.0000 | -234.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 105 | 1 | -0.4750 | 0.5079  | 0.0000 | -240.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 106 | 1 | -0.4624 | 0.5288  | 0.0000 | -246.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 107 | 1 | -0.4500 | 0.5066  | 0.0000 | -252.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 108 | 1 | -0.4375 | 0.5227  | 0.0000 | -258.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 109 | 1 | -0.4250 | 0.5075  | 0.0000 | -264.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 110 | 1 | -0.4125 | 0.5240  | 0.0000 | -270.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |
| 111 | 1 | -0.4000 | 0.5067  | 0.0000 | -276.0 | -0.409E 06 | -0.203E 07 | -0.203E 07 | 0.907E 06 | 0.907E 06 | 0.907E 06 |

|     |   |         |        |        |       |            |            |            |           |           |    |
|-----|---|---------|--------|--------|-------|------------|------------|------------|-----------|-----------|----|
| 112 | 1 | -0.5979 | 0.1383 | 0.0000 | -51.0 | -0.722E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 113 | 1 | -0.5584 | 0.7686 | 0.0000 | -54.0 | -0.696E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 114 | 1 | -0.5176 | 0.7767 | 0.0000 | -57.0 | -0.719E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 115 | 1 | -0.4720 | 0.8227 | 0.0000 | -60.0 | -0.695E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 116 | 1 | -0.4313 | 0.8465 | 0.0000 | -63.0 | -0.719E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 117 | 1 | -0.3804 | 0.8679 | 0.0000 | -66.0 | -0.695E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 118 | 1 | -0.3404 | 0.8669 | 0.0000 | -69.0 | -0.720E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 119 | 1 | -0.2935 | 0.9035 | 0.0000 | -72.0 | -0.695E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 120 | 1 | -0.2439 | 0.9176 | 0.0000 | -75.0 | -0.723E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 121 | 1 | -0.1975 | 0.9292 | 0.0000 | -78.0 | -0.695E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 122 | 1 | -0.1486 | 0.9283 | 0.0000 | -81.0 | -0.725E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 123 | 1 | -0.0993 | 0.9448 | 0.0000 | -84.0 | -0.696E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 124 | 1 | -0.0497 | 0.9487 | 0.0000 | -87.0 | -0.726E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 125 | 1 | 0.0497  | 0.9487 | 0.0000 | 87.0  | -0.726E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 126 | 1 | 0.0993  | 0.9448 | 0.0000 | 84.0  | -0.696E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 127 | 1 | 0.1486  | 0.9283 | 0.0000 | 81.0  | -0.725E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 128 | 1 | 0.1975  | 0.9292 | 0.0000 | 78.0  | -0.695E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 129 | 1 | 0.2439  | 0.9176 | 0.0000 | 75.0  | -0.723E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 130 | 1 | 0.2935  | 0.9035 | 0.0000 | 72.0  | -0.695E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 131 | 1 | 0.3404  | 0.8669 | 0.0000 | 69.0  | -0.720E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 132 | 1 | 0.3804  | 0.8679 | 0.0000 | 66.0  | -0.695E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 133 | 1 | 0.4313  | 0.8465 | 0.0000 | 63.0  | -0.719E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 134 | 1 | 0.4720  | 0.8227 | 0.0000 | 60.0  | -0.695E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 135 | 1 | 0.5174  | 0.7767 | 0.0000 | 57.0  | -0.719E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 136 | 1 | 0.5584  | 0.7686 | 0.0000 | 54.0  | -0.696E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 137 | 1 | 0.5979  | 0.7385 | 0.0000 | 51.0  | -0.722E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 138 | 1 | 0.6357  | 0.7060 | 0.0000 | 48.0  | -0.698E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 139 | 1 | 0.6716  | 0.6717 | 0.0000 | 45.0  | -0.727E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 140 | 1 | 0.7080  | 0.6257 | 0.0000 | 42.0  | -0.698E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 141 | 1 | 0.7353  | 0.5778 | 0.0000 | 39.0  | -0.734E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 142 | 1 | 0.7686  | 0.5284 | 0.0000 | 36.0  | -0.696E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 143 | 1 | 0.7968  | 0.5174 | 0.0000 | 33.0  | -0.739E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 144 | 1 | 0.8227  | 0.4750 | 0.0000 | 30.0  | -0.692E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 145 | 1 | 0.8464  | 0.4313 | 0.0000 | 27.0  | -0.736E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 146 | 1 | 0.8676  | 0.3864 | 0.0000 | 24.0  | -0.697E 04 | -0.214E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 147 | 1 | 0.8860  | 0.3405 | 0.0000 | 21.0  | -0.720E 04 | -0.214E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 148 | 1 | 0.9034  | 0.2936 | 0.0000 | 18.0  | -0.698E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 149 | 1 | 0.9175  | 0.2459 | 0.0000 | 15.0  | -0.691E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 150 | 1 | 0.9297  | 0.1975 | 0.0000 | 12.0  | -0.718E 04 | -0.213E 07 | -0.213E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 151 | 1 | 0.9381  | 0.1486 | 0.0000 | 9.0   | -0.659E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.106E 07 | 0  |
| 152 | 1 | 0.9446  | 0.0993 | 0.0000 | 6.0   | -0.752E 04 | -0.213E 07 | -0.214E 07 | 0.106E 07 | 0.107E 07 | 0  |
| 153 | 1 | 0.9486  | 0.0497 | 0.0000 | 3.0   | -0.775E 04 | -0.213E 07 | -0.213E 07 | 0.107E 07 | 0.107E 07 | 0  |
| 0   | 0 | -0.9736 | 0.0310 | 0.0000 | -3.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 1  |
| 0   | 0 | -0.9626 | 0.1326 | 0.0000 | -9.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 2  |
| 0   | 0 | -0.9416 | 0.2524 | 0.0000 | -15.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 3  |
| 0   | 0 | -0.9107 | 0.3494 | 0.0000 | -21.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 4  |
| 0   | 0 | -0.8687 | 0.4426 | 0.0000 | -27.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 5  |
| 0   | 0 | -0.8177 | 0.5310 | 0.0000 | -33.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 6  |
| 0   | 0 | -0.7578 | 0.6136 | 0.0000 | -39.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 7  |
| 0   | 0 | -0.6895 | 0.6894 | 0.0000 | -45.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 8  |
| 0   | 0 | -0.6136 | 0.7577 | 0.0000 | -51.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 9  |
| 0   | 0 | -0.5310 | 0.8177 | 0.0000 | -57.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 10 |
| 0   | 0 | -0.4460 | 0.8687 | 0.0000 | -63.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 11 |
| 0   | 0 | -0.3494 | 0.9102 | 0.0000 | -69.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 12 |
| 0   | 0 | -0.2525 | 0.9418 | 0.0000 | -75.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 13 |
| 0   | 0 | -0.1525 | 0.9630 | 0.0000 | -81.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 14 |
| 0   | 0 | -0.0510 | 0.9737 | 0.0000 | -87.0 | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 15 |
| 0   | 0 | 0.0510  | 0.9737 | 0.0000 | 87.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 16 |
| 0   | 0 | 0.1525  | 0.9630 | 0.0000 | 81.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 17 |
| 0   | 0 | 0.2525  | 0.9418 | 0.0000 | 75.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 18 |
| 0   | 0 | 0.3494  | 0.9102 | 0.0000 | 69.0  | -0.103E 06 | -0.208E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 19 |

|   |   |        |        |        |      |            |            |            |           |           |    |
|---|---|--------|--------|--------|------|------------|------------|------------|-----------|-----------|----|
| 0 | 1 | 0.4426 | 0.0687 | 0.0000 | 65.0 | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.987E 06 | 0.987E 06 | 21 |
| 0 | 1 | 0.5310 | 0.0777 | 0.0000 | 57.0 | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.987E 06 | 0.987E 06 | 22 |
| 0 | 1 | 0.6150 | 0.0737 | 0.0000 | 51.0 | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.987E 06 | 0.987E 06 | 23 |
| 0 | 1 | 0.6845 | 0.0694 | 0.0000 | 45.0 | -0.103E 06 | -0.204E 07 | -0.207E 07 | 0.987E 06 | 0.987E 06 | 24 |
| 0 | 1 | 0.7576 | 0.0636 | 0.0000 | 39.0 | -0.103E 06 | -0.204E 07 | -0.207E 07 | 0.987E 06 | 0.987E 06 | 25 |
| 0 | 1 | 0.8177 | 0.0510 | 0.0000 | 35.0 | -0.103E 06 | -0.204E 07 | -0.207E 07 | 0.987E 06 | 0.987E 06 | 26 |
| 0 | 1 | 0.8667 | 0.4426 | 0.0000 | 27.0 | -0.103E 06 | -0.204E 07 | -0.207E 07 | 0.987E 06 | 0.987E 06 | 27 |
| 0 | 1 | 0.9101 | 0.4494 | 0.0000 | 21.0 | -0.103E 06 | -0.204E 07 | -0.207E 07 | 0.987E 06 | 0.987E 06 | 28 |
| 0 | 1 | 0.9416 | 0.4524 | 0.0000 | 15.0 | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 29 |
| 0 | 1 | 0.9628 | 0.1526 | 0.0000 | 9.0  | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 30 |
| 0 | 1 | 0.9730 | 0.0210 | 0.0000 | 5.0  | -0.103E 06 | -0.204E 07 | -0.208E 07 | 0.988E 06 | 0.988E 06 | 31 |

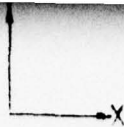
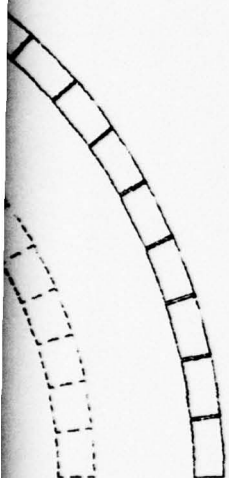
| *** | MAX SIZE OF BASE USED | 2990 | 5000 |
|-----|-----------------------|------|------|
|     | SET 10                |      |      |



PAFEC/DRAW ON 22/03/78

AT 09/29/49

DISPLACED SHAPE PLOT FROM EXAMPLE RUN



DISPLACED SHOWN DOTTED  
SCALE OF DISPLACEMENTS =  
0.00000000 UNITS/CM  
PRG. NO. 1  
SCALE = 0.0859:1

FIG. 1

# Detachable Abstract Cards

These abstract cards are inserted in A.U.W.E. reports and notes for the convenience of librarians and others who need to maintain an information index

|   |   |
|---|---|
| <p><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p>PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> | <p>62:681.3</p> <p><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p>PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> |
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UNCLASSIFIED/UNLIMITED

Detachable Abstract Cards

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|   |   |
|---|---|
| <p align="center"><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p align="right">62:681.3</p> <p align="center">PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> | <p align="center"><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p align="right">62.681.3</p> <p align="center">PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> |
| <p align="center"><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p align="right">62:681.3</p> <p align="center">PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> | <p align="center"><u>UNCLASSIFIED/UNLIMITED</u></p> <p>A.U.W.E. Publication 45685<br/>W. J. Butterworth<br/>April, 1978</p> <p align="right">62.681.3</p> <p align="center">PAFEC75 on the A.U.W.E. ICL 1904S*<br/>A Users Guide</p> <p>PAFEC75 is the latest development in the PAFEC suite which carries out stress or thermal analysis on any structure by means of finite element methods. A guide to the method of use on the 1904S* at A.U.W.E. is given. It is intended that later a dedicated minicomputer will become available.</p> |